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THE 1937-1938 EPIDEMIC OF ACUTE ANTERIOR POLIOMYELITIS IN NEW SOUTH WALES, WITH SPECIAL REFERENCE TO THE CHANGE IN AGE INCIDENCE. POLIOMYELITIS DURING PREGNANCY AND POLIOMYELITIS FOLLOWING TONSILLECTOMY.

By KAREN HELMS,

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THE purpose of this paper is to record certain epidemiological features of the 1937-1938 epidemic of acute anterior poliomyelitis in New South Wales, and to discuss the change in age incidence, poliomyelitis during pregnancy and poliomyelitis following tonsillectomy.

The epidemic began in October, 1937, and continued until the end of 1938. There were 711 cases in the State between October 1, 1937, and September 30, 1938. Table I shows the number of cases and the total population in the metropolitan area of Sydney, in the Newcastle and Hunter River District and in the rest of the State, which consists of small and medium-sized towns and rural districts. (This area of the State, which excludes the metropolis of Sydney, and the Newcastle and the Hunter River District, will be called rural districts in subsequent sections of this paper.)

During the first nine months of 1937 the average monthly incidence in the State was two cases. Between October 3 and 30 five cases occurred in the metropolitan area and seven in rural districts.

Table II and the graph in Figure I show the fortnightly incidence of cases in the metropolitan area, the Newcastle and Hunter River District, and in rural districts. Three children infected in the metropolitan area are not included in these figures because the exact date of the onset of their illness is not known. Paralysis was discovered in these children only when they began to walk, which was some months after the onset of infection. It will be seen that the epidemic reached its peak earlier in the metropolitan area than it did in the rest of the State.

TABLE I.

Area of State.	Population.	Number of Cases between October 1, 1937, and September 30, 1938.
Metropolitan area of Sydney	1,279,080	332
Newcastle and Hunter River District	220,000	110
Rest of State	1,211,600	269

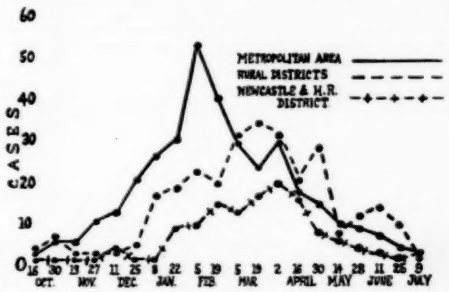

FIGURE I.

Graph showing fortnightly incidence, according to date of onset, in the 1937-1938 epidemic of poliomyelitis in New South Wales.

TABLE II.

Fortnightly Incidence, According to Date of Onset, of Cases in the Metropolitan Area, Rural Districts, and Newcastle and Hunter River District.

Period.	Metropolitan Area.	Rural Districts.	Newcastle and Hunter River District.
October 3 to 16 ..	1	2	—
October 17 to 30 ..	4	5	—
October 31 to November 13	4	1	—
November 14 to 27 ..	9	1	—
November 28 to December 11	11	1	2
December 12 to 25 ..	10	3	—
December 26 to January 8	25	15	—
January 9 to 22 ..	20	17	7
January 23 to February 5	52	21	8
February 6 to 19 ..	39	18	13
February 20 to March 5	28	30	11
March 6 to 19	22	33	15
March 20 to April 2 ..	28	30	18
April 3 to 16	16	19	14
April 17 to 30	13	27	6
May 1 to 14	8	6	4
May 15 to 28	7	10	2
May 29 to June 11 ..	5	12	1
June 12 to 25	2	8	—
June 26 to July 9 ..	1	—	1
July 10 to 23	1	3	—
July 24 to August 6 ..	1	4	—
August 7 to 20	1	—	—
August 21 to September 3	1	—	—
September 4 to 17 ..	2	3	—
September 18 to October 1	—	—	—
Date of onset not known	3	—	8
Total	332	269	110

Effects of Meteorological Phenomena on Epidemics of Acute Anterior Poliomyelitis.

Many observations have been made, particularly by French and German workers, connecting meteorological phenomena with epidemics of acute anterior poliomyelitis. Hornus[1] gives much information on the subject. Levaditi, Schmutz and Willemin[2] found that the temperature curve ran parallel to the morbidity curve and rose about two weeks before it. It has been noted that both a raised barometric pressure and a fall in the level of subterranean water appear to favour the development of poliomyelitis.

The Melbourne epidemic of 1937[3] was preceded by weather which was remarkable in many ways. There were lower temperatures, a smaller amount of solar radiation, less wind, and more fogs and frosts than the average.

I am indebted to the Divisional Meteorologist, Mr. D. J. Mares, for the following report:

The accompanying tables and graphs were prepared with the object of determining the relationship, if any, between the number of recorded cases of infantile paralysis and the meteorological elements in the period from October, 1937, to September, 1938, inclusive.

Of the meteorological elements employed in this discussion, I am of opinion that the temperature and absolute humidity curves exhibit the closest correlation with the increase and decrease in the number of cases. The latter, commencing in spring, attains a maximum in a midsummer month and thence declines.

The parallelism of the temperature and absolute humidity curves with the waxing and waning in the number of cases is depicted on the respective graphs.

I think, also, that somewhat similar correlation could be shown in the incidence of seasonal rainfall in northern parts of New South Wales, which results chiefly from tropical activity.

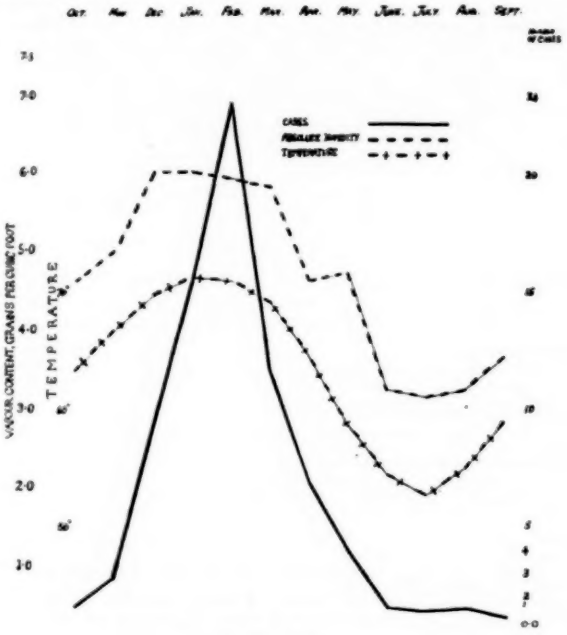

FIGURE II.

Graph illustrating the increase and decrease in the mean weekly temperature, absolute humidity and number of cases of infantile paralysis in the period October, 1937, to September, 1938.

Proportion of Patients with Severe Paralysis in Different Stages of the Epidemic.

Table III gives the percentage of patients who developed paralysis of moderate or great severity at different stages of the epidemic. Patients with transitory muscle weakness

TABLE III.

Proportion of Cases in which Severe Paralysis was Present at Different Periods of Epidemic.

Period of Epidemic.	Total Cases.	Number Associated with Severe Paralysis.	Percentage Associated with Severe Paralysis.	Deaths.
Metropolitan Area:				
October 3 to January 1 (beginning)	58	29	50·0	—
January 2 to February 5 (height)	98	27	27·5	1
February 6 to April 2 (weekly incidence falling) ..	117	30	25·6	2
April 3 to September 30 (end)	59	21	35·5	—
Total	332	107	32·6	3
Rural Districts:				
October 3 to February 19 (beginning)	82	47	57·3	4
February 20 to April 2 (height)	96	40	41·6	3
April 3 to April 30 (fall)	45	25	55·5	2
May 1 to October 1 (end)	46	22	47·8	2
Total	269	134	49·8	11

are not included in these figures. In the metropolitan area, during the early weeks of the epidemic and while the weekly incidence of cases was increasing, a greater proportion of patients developed severe paralysis than during the later stages of the epidemic. In rural districts the tendency for a greater proportion of cases with severe paralysis to occur in the early months may be masked by the fact that in these districts a relatively small population is spread over a large area, with small concretions in the towns, and a series of small epidemics is produced as the infection reaches town after town. In rural districts the number of deaths was greater at the beginning and at the height of the epidemic than in the later stages. In the 1937 epidemic in Denmark, Henningsen and Rasch[4] found that the percentage of paralysis was higher in the latter part of the epidemic than in the first part. On the other hand, the 1931-1932 epidemic in New South Wales[3] appeared to be more severe in its earlier than in its later stages, as the case fatality rate was highest at the beginning of the epidemic, and while the incidence was rising. Kellogg[6] noted the same phenomenon in the New York epidemic of 1916. Thus the evidence in reference to the effect of the stage of the epidemic on the severity of the infection is conflicting. The 1931-1932 and 1937-1938 epidemics in New South Wales and the 1916 epidemic in New York appeared to be more severe at the beginning; the 1937 epidemic in Denmark appeared to be more severe towards its end.

Age Distribution during the Course of the Epidemic.

Table IV shows the age distribution during the course of the epidemic in the metropolitan area and rural districts.

In the metropolitan area there appears to be a tendency for the age group up to four years to be proportionately larger and the over fifteen years group to be proportionately smaller at the beginning of the epidemic than in its later stages. This tendency may be masked in rural districts for the reason given under the heading "Proportion of Patients with Severe Paralysis in Different Stages of the Epidemic"—that in these districts a series of small epidemics occurs as the infection spreads from town to town. In all the reports[4][7][8] of epidemics which give information on the variation in age distribution during the course of the epidemic, the lower age groups have shown a greater proportion early, and the higher age groups a greater proportion late in the epidemic.

Fatality Rate.

Table V gives the fatality rate in the State of New South Wales, in the metropolitan area of Sydney, in the Newcastle and Hunter River District, and in rural districts.

All these rates are lower than those found in the majority of epidemics of acute anterior poliomyelitis. The fatality rate in the 1931-1932 epidemic in New South Wales was 13·1% (57 deaths in 435 cases).

TABLE V.

Area.	Cases.	Deaths.	Fatality Rate. (Percentage.)
New South Wales ..	711	17	2·5
Sydney	332	3	0·9
Newcastle and Hunter River District	110	3	2·7
Rural districts	269	11	4·08

Types of the Disease, Sex Incidence and Age Incidence.

Table VI shows the distribution, according to type of disease, sex and age, of cases in the metropolitan area and rural districts.

The non-paralytic type includes all cases in which muscle weakness was not found, but in which the typical prodromal symptoms and physical signs of acute anterior poliomyelitis were found. In Table VI they are given under two headings. The number in which the cerebro-spinal fluid was found to have a cell content of over ten leucocytes per cubic millimetre or a total protein content of more than 0·04% is shown under "C.S.F.+". The cases listed under "Typical Symptoms" are those in which an examination of the cerebro-spinal fluid was not made, in addition to a small number in which no pathological changes were found in the cerebro-spinal fluid. Twenty non-paralytic cases notified in the metropolitan area and thirteen notified in rural districts are not included in these figures, because it was considered that the description given of the signs and symptoms did not justify a diagnosis of acute anterior poliomyelitis.

The spinal type includes cases in which there was weakness or paralysis of muscles supplied by segments of the spinal cord. An attempt has been made to indicate the degree of muscle weakness by dividing cases of the spinal type into two categories; but a hard and fast line cannot be drawn between them.

The bulbar type includes cases in which there was paralysis of muscles supplied by nuclei in the *medulla oblongata*, pons or mid-brain. Details of the lesions found in these cases are given in Table VII. The mortality rate in cases of the bulbar type was 7·4% (five deaths in 67 cases). After the acute stage was passed paralysis cleared up rapidly in the great majority of these cases. Only three patients with facial paralysis needed prolonged muscle reeducation.

In cases listed under the encephalitic type pronounced and persistent drowsiness was present.

Cases under "other types" include eight associated with ataxia, one with ataxia and spinal paralysis, two with ataxia and bulbar symptoms, and one with paralysis of the lower limbs of the upper motor neurone type.

The symptomatology and treatment of 250 patients admitted during this epidemic to the Royal Alexandra Hospital for Children have already been described in detail in this journal.[9]

TABLE IV.

Age Distribution During Course of Epidemic.

Period of Epidemic.	Number of Cases.	Percentage Incidence in Age Groups.			
		0 to 4 Years.	5 to 9 Years.	10 to 14 Years.	15 Years and Over.
Metropolitan Area:					
October 3 to January 1 (beginning)	58	48·2	36·2	13·7	1·7
January 2 to February 5 (height)	98	28·5	43·8	13·2	14·2
February 6 to April 2 (weekly incidence falling)	117	37·9	37·9	13·8	10·3
April 3 to September 30 (end)	59	25·4	44·0	15·2	15·2
Rural Districts:					
October 3 to February 19 (beginning)	82	23·1	32·9	19·5	24·3
February 20 to April 2 (height)	96	17·7	34·3	28·1	19·7
April 3 to April 30 (fall)	45	24·4	37·7	13·3	24·4
May 1 to September 30 (end)	46	21·7	26·1	34·7	17·4

TABLE VI.

Type of Disease.	0 to 4 Years.		5 to 9 Years.		10 to 14 Years.		15 to 19 Years.		20 to 29 Years.		Over 30 Years.	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Metropolitan Area:												
Non-paralytic:												
(a) C.S.F.+	23	5	28	16	14	5	2	2	1	1	—	—
(b) Typical symptoms	3	—	1	2	4	—	1	—	—	—	—	—
Spinal:												
(a) Paralysis	22	16	17	20	5	6	7	3	1	5	2	2
(b) Slight weakness of muscles	19	11	17	3	3	3	1	1	3	1	—	—
Bulbar	4	1	8	3	2	3	—	—	—	—	—	—
Bulbo-spinal	1	—	7	2	1	1	1	—	—	—	—	—
Encephalitic	2	1	2	2	—	—	—	—	—	—	—	—
Other Types	4	3	3	4	1	—	—	—	—	—	—	—
Deaths	—	—	—	2	—	—	1	—	—	—	—	—
Total (exclusive of deaths)	78	37	83	52	30	18	12	6	5	7	2	2
Rural Districts:												
Non-paralytic:												
(a) C.S.F.+	5	1	5	3	8	2	4	—	1	—	—	—
(b) Typical symptoms	—	3	7	8	5	1	1	1	1	—	—	—
Spinal:												
(a) Paralysis	17	6	23	13	14	19	11	3	14	4	4	3
(b) Slight weakness of muscles	12	4	14	3	7	3	1	1	—	1	4	—
Bulbar	3	4	6	1	2	—	—	1	—	1	—	—
Bulbo-spinal	2	1	4	—	2	2	—	—	—	—	2	—
Encephalitic	—	—	1	—	—	—	—	—	—	—	—	—
Other Types	—	—	—	—	—	—	—	—	—	—	—	—
Deaths	1	—	—	1	1	4	1	—	1	—	2	—
Total (exclusive of deaths)	38	19	60	29	38	27	17	6	16	6	10	3

Of the patients affected, 389, or 64%, were males and 212, or 36%, females. The excess of males over females has been described as one of the most constant epidemiological features of the disease.[9]

TABLE VII.

Bulbar Paralysis.

Site of Paralysis.	Number of Patients Affected.
Palate	26
Face	37
Eye muscles	8
Pharynx	10
Tongue	3
Larynx	2
Neck	5

Table VIII shows the age incidence in paralytic and non-paralytic cases in the metropolitan area and rural districts. The oldest patient was aged sixty-three years and the youngest seven months. There were only five patients under the age of twelve months. The percentage of patients below the age of ten years is seen to be greater in the metropolitan area (paralytic cases 76·8%) than in rural districts (paralytic cases 53·5%). A tendency for the age of highest incidence to vary inversely with the density of population has been noted in many epidemics.[9]

Several authors have drawn attention to a change which has occurred in the last twenty years in the age incidence of poliomyelitis. This is a decrease in the proportion of cases in the age group from birth to four years and an increase in the higher age groups. Forsbeck and Luther[10] have described this change in Massachusetts, Wells[11] in New York, Wilson and Walker[12] in San Francisco, Dauer[13] in the United States of America, Jensen[14] and Nissen[15] in Denmark.

The age groups of patients notified as suffering from poliomyelitis in New South Wales have been recorded since 1914. Table IX gives the percentage of patients in each age group in four periods between 1914 and 1939. These periods include the years in which the larger

TABLE IX.

Poliomyelitis in New South Wales: Age Incidence.[14] [1]

Age in Years.	Case Percentage in Period.			
	1915–1917. (390 Cases.)	1920–1923. (366 Cases.)	1930–1933. (530 Cases.)	1937–1938. (514 Paralytic Cases.)
0 to 4	79·49	65·85	46·98	32·2
5 to 9	12·56			35·2
10 to 14	3·33	27·87[1]	39·62[1]	16·1
Over 15	4·36	5·74	12·27	16·3
Not stated	0·26	0·54	1·13	

[1] This includes all age groups from five to fourteen years.

TABLE VIII.

—	Percentage Incidence in Age Groups.					
	0 to 4 Years.	5 to 9 Years.	10 to 14 Years.	15 to 19 Years.	20 to 29 Years.	Over 30 Years.
Metropolitan Area:						
Paralytic cases (total 224)	37·5	39·3	11·1	5·8	4·4	1·8
Non-paralytic cases (total 108)	28·7	43·5	21·2	4·6	1·8	—
Rural Districts:						
Paralytic cases (total 213)	22·5	31·0	23·0	8·0	9·3	6·1
Non-paralytic cases (total 56)	16·0	41·0	28·5	10·7	3·5	—

epidemics occurred. Unfortunately the numbers of patients in the two age groups five to nine years and ten to fourteen years were not recorded separately between 1918 and 1937; but the progressive decrease in the percentage of patients in the age group from birth to four years is evident.

The reason for this change is not clear. Forsbeck and Luther[10] did not consider that it could be explained by the change in the age distribution of the general population of Massachusetts. In an appendix to this paper will be found the result of an investigation kindly made by Mr. W. J. Willcocks, of the Bureau of Statistics and Economics, New South Wales. The conclusion at which Mr. Willcocks arrived was "that it seems quite reasonable to assert that the decrease in the proportion of cases at ages under five years and corresponding increase over five years are due to factors other than the changing age distribution of the population". Aycock has suggested that the change is due to better diagnosis.[9] This is almost certainly a factor in the greater number of cases reported in adults, but is probably not the explanation of the increased percentage of patients in the five to nine years age group. Heaslip[17] states that "it is probable that there is a relationship between nutrition and age incidence in this disease". McCormick[18] considers that "improved infant hygiene, particularly the adaptation of the newer knowledge of the vitamins to the dietetics of infants and childhood," may have influenced the age incidence. In recent years a definite effort has been made in New South Wales, through such organizations as baby clinics and free kindergartens, to improve the nutrition of infants. It appears from the work of Clements[19] that there is much room for improvement in the diet of children aged over six years. In 1937 and 1938 Clements examined for evidence of malnutrition 1,258 children living in Sydney. The children were between the ages of nine months and twelve years. Clements found that the incidence of malnutrition was lowest during the kindergarten period. He ascribed this to the influence of the free kindergartens, which provide milk, wholemeal bread, salads and cheese for the children. He made the following statement:

> Amongst the two and five year olds attendance at a kindergarten aids considerably in producing satisfactory nutrition, while amongst the three and four year olds it absolutely ensures that the children attending will, in general, be superior to those who do not.

In the kindergarten group 18% showed evidence of unsatisfactory nutrition; but in the six to eight years age group 29% and in the nine to twelve years age group 33% of children showed some evidence of malnutrition. Clements divided the children in the six to twelve years age group giving evidence of unsatisfactory nutrition into two categories. The first consisted of those who were selectors of their food. In general the articles selected were meat and bread to the exclusion of green and root vegetables. The second category consisted of children who would not eat prepared meals, but "were invariably found to eat frequent small meals between their regular meals. These small irregular meals invariably consisted of biscuits, cakes and other carbohydrates". Clements found that the children in both categories were accustomed to eat large quantities of those foods which have a low calcium, high phosphate ratio. The great influence of nutrition on susceptibility to infection is widely recognized. The relation of the vitamins, and especially of vitamin B_1, to poliomyelitis will be discussed in another paper.

Burnet[20] considers that a change in character of the virus "must be postulated to explain the changed age incidence of the disease . . ." In the United States of America the Office of Epidemiological Studies compared the trends for twenty-five years in the death rates for poliomyelitis at different ages with similar trends in age-specific death rates for meningitis, diphtheria, scarlet fever, measles and whooping cough.[21] Fatal poliomyelitis was found to have lessened its preference for the lower ages irrespective of the change in the age distribution of the population; but this change was also found to have occurred in scarlet fever, meningitis and diphtheria. If the age incidence of several diseases has been affected in the same way, it would seem that the probable cause of the change was a factor common to all these diseases. Several investigators[9,22,23] have commented on the fact that there has been a similar change in the age incidence of diphtheria, and the disease is now represented as concentrating more on children of school age. Cheeseman, Martin and Russell[23] consider that this has been due to a decline in the average size of the family. They make the following statement:

> Where the family is small there is obviously less chance of the pre-school children acquiring partial or complete immunity. They live a rather sheltered existence and reach school as a virgin population susceptible to infection. Proportionately more of them will reach school age without a latent immunity and become infected in the herd environment of the school classroom.

These authors show that in each London borough between 1911 and 1931 the decrease in the birth rate—an index of the change in the size of the family—can be positively and significantly correlated with the corresponding change in the size of the ratio of the case rates of diphtheria at ages from birth to four years and from five to nine years.

Dauer[24] has reported on epidemics which occurred in the United States of America in 1939. He points out that during this year in Charleston County, South Carolina, 68% of the patients were aged under five years, while in Genesee County, New York, only 14% were aged under five years. Birth rates for the counties are not available. The latest available birth rates for the United States are those of 1936, when the birth rate per 1,000 of estimated population was 14·1 in New York and 21·1 in South Carolina.[25] If Cheeseman, Martin and Russell's explanation of the change in the age incidence of diphtheria can be applied to poliomyelitis, one would expect in New York State a lower percentage of patients aged under five years than in South Carolina. This is what Dauer found.

It is suggested that both nutrition (especially vitamin nutrition) and the average size of the family may be factors in the change in the age incidence of poliomyelitis which has occurred during the last twenty years.

Poliomyelitis during Pregnancy.

In recent years the number of reported cases of poliomyelitis contracted during pregnancy has increased. In 1906 Schell[26] described a patient who developed poliomyelitis when she was seven months pregnant. Renault and Martingay[27] reported one case in 1911, Miller[28] two cases in 1924, Hornung and Creutzfeldt[29] one case in 1930, and McGoogan[30] three cases in 1932. In 1932 Aycock stated that he had encountered ten cases of poliomyelitis in late pregnancy during the previous two years.[9] He considered that this was out of proportion to what would normally have been expected if the condition had not predisposed the patient to the disease. In 1933 Brahdy and Lenarsky[31] reported three cases and reviewed the literature on the subject. Fischer and Stillerman[32] described one case in 1937, Klein and Sitig[33] one case in 1938, Morrow, Luria and Ridgewood[34] one case in 1939. In the 1937-1938 epidemic of poliomyelitis in New South Wales five patients contracted the disease during pregnancy. Details of their illness are given below.

E.D., aged thirty-five years, was five months pregnant; it was her fifth pregnancy. She was admitted to hospital on January 27, 1938. The patient stated that her legs had become swollen six weeks before, her legs and back had begun to ache on January 21, and her legs had become powerless on January 25. On examination she was found to have widespread paralysis of the abdominal muscles and of both lower limbs. The cerebro-spinal fluid contained 26 leucocytes per cubic millimetre, and 0·08% total protein. She had albuminuria. On February 2 a macerated fœtus was expelled. This patient left hospital against medical advice and was without treatment for some months. Two years after the onset of her illness she still had widespread paralysis of the lower limbs, and there was definite weakness of the abdominal muscles.

M.D., aged twenty-nine years, was six months pregnant; it was her second pregnancy. She was admitted to hospital on January 23, 1938, with a history of malaise, fever, vomiting, headache and pain in the legs of one week's duration, and of weakness of the right arm of three days' duration. On examination weakness of the muscles of the right arm and forearm was observed.

The patient was normally delivered of a full-term child in April, 1938. Two years later this patient had only very slight weakness of the muscles of the right arm and forearm.

M.B., aged twenty-one years, a *primipara*, was in the eighth month of pregnancy. She was admitted to hospital on February 6, 1938, with a history of headache, fever, vomiting, constipation, malaise and stiffness of the neck and spine, which had lasted for two days, and had been followed by paralysis of the left upper limb, abdominal muscles, back muscles and muscles of both lower limbs. One month later this patient was transferred from a rural district to a hospital in Sydney. A Cæsarean section was performed, as the paralysis appeared to be spreading to the respiratory muscles. Two years after infection the patient had paralysis of almost all the muscles of both lower extremities, of the left upper extremity, and of the abdominal and back muscles.

R.H., aged eighteen years, was six months pregnant. On March 10 the patient complained of fever, headache, constipation and stiffness in the neck and spine. On March 13 there was paralysis of both *recti abdominis*, of the flexors of the head, and of the muscles of the left lower limb. The report stated that there were 28 cells per cubic millimetre of cerebro-spinal fluid—"mostly lymphocytes". Three months later both *recti abdominis* were severely affected, but the patient had regained normal power in her neck muscles and in the muscles of the left lower limb. She had a normal rapid confinement.

M.H., aged thirty-six years, was nine months pregnant; it was her eighth pregnancy. On April 22 the patient complained of fever, headache, nausea, stiffness of the neck and spine, and muscle tenderness. On April 23 paralysis developed in the muscles of the right hand, forearm and arm, neck, back and abdomen. She had weakness of the muscles of the left hand and arm. On May 5 she was normally delivered of a full-time child. Two years later this patient had regained almost normal power in the muscles of her neck, back, left lower limb and right arm. There was still weakness of her abdominal muscles and of her right hand and forearm.

Of eighteen cases reported in the literature with information concerning the effect of the onset of poliomyelitis on pregnancy, there is only one in which spontaneous abortion has followed closely on the infection; this was the case of E.D. in this epidemic. As this patient had albuminuria and swelling of the legs, the death of the fœtus may have been due to preeclamptic toxæmia.

No well-authenticated case has been reported of intrauterine infection of the fœtus following poliomyelitis contracted during pregnancy. Brahdy and Lenarsky[31] have reviewed the literature up to 1933. The report on the case of poliomyelitis in a newly born child published by Lance[65] is not available; but Morrow, Luria and Ridgewood[34] state that the evidence presented is inconclusive, and there was no history of an acute infection during the course of pregnancy.

In 13 of 15 cases listed in Table X, in which the pregnancy continued beyond the seventh month, there was a normal delivery of the child. In the remaining two cases Cæsarean section was performed on account of respiratory paralysis. Numerous instances have been reported of complete paraplegia complicating pregnancy. The labour in these cases was usually uncomplicated and painless.[36] Danforth and Ivy[37] make the following statement:

> It is apparent that the extrinsic nerves are entirely unnecessary for the spontaneous inception and maintenance of labor . . . the facts that placentation, pregnancy, and parturition may proceed unhindered after transsection of the spinal cord, or after lumbar sympathectomy, or after section of all the extrinsic nerves and removal of the utero-vaginal ganglion in the dog (Ivy) are adequate proof that under ordinary circumstances these mechanisms are not necessary to the normal course and termination of pregnancy. The role of the intrinsic uterine plexuses is debatable since they are obviously concerned in certain special instances, but apparently not in others . . .

Poliomyelitis uncomplicated by respiratory paralysis is not an indication for the interruption of pregnancy. In the presence of respiratory paralysis during the last weeks of pregnancy, respiration may be facilitated by removal of the fœtus. Cæsarean section may then be indicated.

Table X.

Details of Eighteen Cases of Pregnancy Complicated by Acute Anterior Poliomyelitis.

Source.	Age of Patient (Years) and Number of Pregnancy.	Month of Pregnancy.	Paralysis.	Delivery.	Child.
N.S.W. epidemic, 1937–1938:					
E.D.	35; fifth.	Fifth.	Both lower extremities; abdominal muscles.	Fœtus expelled one week after onset of infection.	——
M.D.	29; second.	Sixth.	Right arm and shoulder.	Normal, at term.	Normal.
M.B.	21; first.	Eighth.	Both lower extremities, trunk muscles, left upper extremity.	Cæsarean section at term	Normal.
R.H.	18; fourth (?).	Sixth.	Abdominal muscles.	Normal, at term.	Normal.
M.H.	36; eighth.	Ninth.	Left arm, shoulder, neck and back and abdominal muscles.	Normal, at term.	Normal.
Schell[33]	Not given; second.	Seventh.	Both lower extremities.	Normal, at term.	Normal.
Renault and Martingay[17]	23; third.	Fifth.	Both lower extremities.	Normal, at term.	Normal.
Miller[30]	Not given; third.	Third.	Both lower extremities.	Normal, at term.	Bilateral club foot, not poliomyelitis.
Miller[30]	Not given; first.	Fifth.	——	Cæsarean section (premature).	Dead.
Hornung and Creutzfeldt[35]	20; first.	Eighth.	Ascending type with respiratory involvement.	Cæsarean section.	Normal.
McGoogan[32] ..	24; first.	Third.	Right lower extremity.	Normal, at term.	Normal.
McGoogan[32] ..	32; second.	Third.	Hip muscles; abdominal muscles.	Normal, at term.	Normal.
McGoogan[32] ..	24; first.	Third.	Both lower extremities; left upper extremity.	Normal, premature.	Normal.
Brahdy and Lenarsky.[31]	22; second.	Ninth.	Both lower extremities.	Normal, at term.	Normal.
Brahdy and Lenarsky.[31]	23; first.	Fourth.	Right lower extremity.	Normal, premature.	Normal.
Brahdy and Lenarsky.[31]	19; first.	Second.	Both lower extremities, back, abdomen.	Therapeutic abortion at two months.	——
Fischer and Stillerman.[33]	——	Eighth.	Both lower extremities; weakness abdominal muscles.	Normal, at term.	Normal.
Morrow *et alii*[34] ..	28.	Sixth.	Both lower extremities.	Normal, at term.	Normal.

Acute Anterior Poliomyelitis following Tonsillectomy and Adenoidectomy.

Several authors have pointed out that the operations of tonsillectomy and adenoidectomy have been followed within a period of five to twenty-two days by an attack of acute anterior poliomyelitis. A high incidence of the bulbar type of the disease has been noted in these cases. In 1928 Ayer[38] described nine cases of poliomyelitis which developed five to ten days after tonsillectomy. All were of the bulbar type. Aycock and Luther[39] reported 16 cases in which there was a history of tonsillectomy within one month prior to the attack of poliomyelitis. Eleven were of the bulbar type. In all cases the operation had been performed between seven and eighteen days before the onset of the disease. Silverman[40] observed five cases, in four of which bulbar paralysis was present and in one of which weakness of the neck muscles occurred between nine and nineteen days after tonsillectomy. In an epidemic of 686 cases Fischer and Stillerman[32] noted that ten patients showed signs of poliomyelitis between ten and twenty-two days after tonsillectomy. In eight instances the onset of the disease was on the tenth, eleventh or twelfth day after operation, in one it was on the sixteenth day, and in one it was on the twenty-second day. In five of the ten patients bulbar and encephalitic manifestations occurred. The incidence of bulbar and encephalitic forms among the 686 cases comprising the epidemic was a much lower proportion—69 cases, or 10%. In 1938 Anderson and Dixon[41] reported two cases. Both patients developed bulbar paralysis and died twelve days after tonsillectomy. Poliomyelitis was prevalent in the district at the time. During an epidemic Eley and Flake[42] found that 17, or 12·98%, of 131 patients with bulbar poliomyelitis had had tonsillectomy or adenoidectomy performed within twenty days prior to the onset of the illness. Of 287 patients with the spinal form, only three had had tonsillectomy or adenoidectomy within twenty days of the onset of the illness. Among 52 patients, Stillerman and Fischer[43] found three who had had tonsillectomy performed within the month preceding their illness. Two of these patients underwent the operation fourteen days and the third twenty-one days before the onset of the disease. All three had the bulbar type of paralysis, and all of them died. Stillerman and Fischer state that recently Aycock has noted two cases and Ayer six cases, all of which were of the bulbar type. Koskoff, Amshel and Lebeau[44] have reported two cases following tonsillectomy and adenoidectomy. A child, aged five years, had regurgitation of food through the nose, headache and malaise on the eighth day after operation. A child, aged two years, had difficulty in swallowing ten days after operation. Further symptoms and signs of bulbar involvement developed in both children, and both died within a few days of the onset of paralysis.

Of 711 patients infected in the 1937-1938 epidemic in New South Wales, seven are known to have had tonsillectomy and adenoidectomy seven to twenty-two days prior to the onset of the illness. Two of the seven patients had had the operation seven days before, three ten days before, one fourteen days before, and one twenty-one days before the onset. Three of the seven patients developed bulbar and spinal paralysis. Two had paralysis of the palate. One had spinal paralysis, but no evidence of bulbar involvement was detected. One patient had the non-paralytic form of the disease. There were no deaths.

Many operations for the removal of tonsils and adenoids are performed. The number is difficult to determine with accuracy, so that the incidence of poliomyelitis following within a month of tonsillectomy or adenoidectomy has not yet been shown to be higher than that found in the general population. As Faber[45] has pointed out, however, the great proportion of bulbar cases in poliomyelitis following adeno-tonsillectomy, and the experimental work of Sabin,[46] support the contention that the operation provides a portal of entry through the traumatized cranial nerves supplying the tonsillar fossa and the nasopharynx to virus already present in that region. The virus has been obtained from the throat of a healthy child who had no history of contact with poliomyelitis.[47] Sabin[46] injected one cubic centimetre of 10% virus suspension into each tonsillar region of 20 monkeys. Poliomyelitis developed in 16, or 80%. In 13 instances the disease was of the bulbar type. Sabin concludes that the high incidence of the bulbar type of the disease, together with other evidence that the virus did not produce the infection by invasion along the olfactory pathway, indicates that after tonsillo-pharyngeal injection the virus progresses along the local peripheral nerves. "The high incidence of the bulbar form of the disease among the cases of human post-tonsillectomy poliomyelitis is what one would expect, therefore, if the infection occurred from the throat." Burnet[20] infected eight cynomolgus monkeys by swabbing virus over the pharyngeal region. Five of these had "initial symptoms suggestive of a primary attack on the medullary centres". The other three showed primary paralysis corresponding to infection of the lumbar cord.

Table XI shows the cases of poliomyelitis following tonsillectomy and adenoidectomy which have been reported in the literature. The proportion associated with bulbar involvement is shown, and amounts to 80% of the total number of cases.

TABLE XI.

The Number of Cases Reported in the Literature Occurring Five to Twenty-five Days after Tonsillectomy or Adenoidectomy.

Source.	Cases.	Bulbar Type.
Ayer (1928)	9	9
Aycock and Luther (1929)	16	11
Silverman (1931)	5	4
Fischer and Stillerman (1937)	10	5
Anderson and Dixon (1938)	2	2
Eley and Flake (1938)	20	17
Stillerman and Fischer (1938)	3	3
Aycock (1938)	2	2
Ayer (1938)	6	6
Koskoff, Amshel and Lebeau (1939)	2	2
1937–1938 epidemic, New South Wales	7	5
Total	82	66 (80%)

The number of instances of bulbar involvement in 601 cases in the 1937-1938 epidemic in New South Wales was 67, or 11·1%. The duration of the incubation period of anterior poliomyelitis is considered to be between six and eighteen days.[9] Fairbrother[48] has shown that a prolonged incubation period may occur when small amounts of virus are injected. A prolonged incubation period, a small dose of virus, or entrance of the virus after operation could account for the delay in the cases in which the symptoms appeared eighteen to twenty-two days after the operation.

There is strong evidence in support of the contention that operations on the throat and nose favour the development of poliomyelitis of the bulbar type. When this disease is prevalent the risk of subsequent invasion by the virus should be well weighed before such operations are undertaken.

Summary.

1. A table and a graph are given which show the fortnightly incidence of 711 cases of acute anterior poliomyelitis which occurred in New South Wales (332 in the metropolitan area, 110 in Newcastle and the Hunter River district, and 269 in rural districts) between October 1, 1937, and September 30, 1938.

2. The amount of severe paralysis at different periods of the epidemic, the age distribution during the course of the epidemic, the frequency of the various types of the disease, and the sex and age incidence, are given for 332 cases in the metropolitan area and 269 cases in rural districts.

3. The change in the age incidence of the disease, poliomyelitis during pregnancy, and poliomyelitis following tonsillectomy are discussed.

Conclusions.

1. Poliomyelitis uncomplicated by respiratory paralysis is not an indication for the interruption of pregnancy.

2. Operations on the nose and throat should not be performed when poliomyelitis is prevalent without serious consideration of the danger of predisposing the patient to infection by such operations.

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Appendix.

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Has There Been a Change in the Age Incidence of Infantile Paralysis?

1. Has there been a change in the age incidence of infantile paralysis? To answer this question, when the disease incidence varies rapidly from age to age, as it does in the cases under review (1915-1917 figures taken as a guide), it is important that the incidence should be measured for the smallest possible grouping of the numbers exposed to risk. For practical purposes this means the calculation of a morbidity rate for each single year of age; but here lies obstacle number 1, for the case incidence is available in five-year or ten-year age groups only (1915-1917 excepted).

TABLE XII.

Acute Anterior Poliomyelitis (Infantile Paralysis). Table Illustrating "Weighting" Effect of Differential Age Distribution of Population in the Calculation of Morbidity Rates.

Age in Years.	Morbidity Rates on Experience of 1915–1917 (per 1,000 of Population).	1916.		1921.		1933.	
		Population.	Expected Deaths.[1]	Population.	Expected Deaths.[1]	Population.	Expected Deaths.[1]
Under 1	0·839	49,280	41·3	53,160	44·6	42,370	35·5
1 and under 2	0·589	49,250	29·0	45,800	27·0	43,200	25·4
2 and under 3	0·383	46,970	18·0	45,750	17·5	46,540	17·8
3 and under 4	0·227	46,990	10·7	46,960	10·7	48.530	11·0
4 and under 5	0·100	43,360	4·3	47,650	4·8	49,160	4·9
Total under 5	—	235,850	103·3	239,320	104·6	229,800	94·6
Morbidity rate for total under 5 years.	—	0·438 per 1,000 of population.		0·437 per 1,000 of population.		0·412 per 1,000 of population.	

[1] "Expected" deaths calculated by assuming that morbidity rates remain constant at level of experience of 1915-1917.

TABLE XIII.

Acute Anterior Poliomyelitis (Infantile Paralysis). Age Incidence of Cases Notified in New South Wales.

Age.	1915 to 1917.			1920 to 1923.			1930 to 1933.			1937 to 1938. (Paralytic Cases.)		
	Number.	Percentage.		Number.	Percentage.		Number.	Percentage.		Number.	Percentage.	
		Total Under Age 15.	Total at All Ages.		Total Under Age 15.	Total at All Ages.		Total Under Age 15.	Total at All Ages.		Total Under Age 15.	Total at All Ages.
Under 6 months	9	2·42	2·31	25	7·29	6·83	20	4·36	3·77	166	38·61	32·30
6 months and under 1 year	115	30·91	29·49									
1 year and under 2 years	87	23·39	22·31									
2 years and under 3 years	54	14·52	13·85	216	62·97	59·02	229	49·89	43·21			
3 years and under 4 years	32	8·60	8·20									
4 years and under 5 years	13	3·49	3·33									
Total under 5 years	310	83·33	79·49	241	70·26	65·85	249	54·25	46·98	166	38·61	32·30
5 years and under 10 years	49	13·17	12·56	102	29·74	27·87	210	45·75	39·62	181	42·09	35·21
10 years and under 15 years	13	3·50	3·33							83	19·30	16·15
Total under 15 years	372	100·00	95·38	343	100·00	93·72	459	100·00	86·60	430	100·00	83·66
15 years and under 20 years	11		2·82	16		4·37	51		9·62	84		16·34
20 years and under 25 years	2		0·51									
25 years and under 35 years	4		1·03	5		1·37	10		1·89			
35 years and under 45 years							2		0·38			
45 years and under 55 years							2		0·38			
Age not stated	1		0·26	2		0·54	6		1·13			
All ages	390		100·00	366		100·00	530		100·00	514		100·00

TABLE XIV.

Distribution of Population of New South Wales at Single Ages under Fifteen Years.

Age in Years.	1916 (Approximate).		1921 (Census).		1933 (Census).		1938 (Approximate).	
	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.	Number.	Percentage.
0	49,280	39·38	53,160	35·31	42,370	31·40	45,580	31·12
1	49,250		45,800		43,200		45,530	
2	46,970		45,750		46,540		42,630	
3	46,990		46,960		48,530		41,180	
4	43,360		47,650		49,160		40,610	
5	41,900		47,800		49,600		41,240	
6	39,500	32·54	47,750	34·55	50,010	34·42	42,460	32·72
7	38,610		47,350		50,390		46,010	
8	37,830		46,300		50,750		48,080	
9	37,060		44,950		51,090		48,780	
10	36,140	28·08	43,500	30·14	51,390	34·18	49,270	36·16
11	35,010		42,100		51,550		49,710	
12	33,520		40,800		51,410		50,110	
13	32,230		39,570		48,570		50,480	
14	31,320		38,350		47,150		50,820	
Total	598,970	100·00	677,770	100·00	731,710	100·00	692,490	100·00

2. Is it possible, then, to calculate morbidity rates for these age groups? Because the incidence of the disease varies rapidly from age to age, it is essential that, in each of the periods being compared, the populations at the component ages of a particular age group should bear approximately the same proportionate relationship to the total of the group. This is not so in the years under review (1915 to 1938), for there have been pronounced changes within age groups (see age group from birth to four years in 1921 and 1933, also age group five to nine years in 1921, 1933 and 1938). These changes cause a differential "weighting" at each age within the group. For instance, even though the morbidity rates in the age group from birth to four years remained the same in 1921 and 1933 as in 1916, the "weighting" effect of the differential age distribution would be as shown in Table XII. Thus it will be seen that the rates calculated on a group total may not be a true reflex of the trend in the rates of the individual components of the group.

This difficulty creates obstacle number 2, which makes it undesirable to calculate morbidity incidence rates for age groups as at present recorded for infantile paralysis.

3. The two obstacles outlined above prevent the exact measurement of the changes taking place; but there are such noticeable trends in the data available that it is still possible to generalize upon them. Broadly speaking, there has been an "ageing" of the population. This would reduce the number exposed to risk of the higher morbidity rates at lower ages and increase the number exposed to lower rates at higher ages. Irrespective of the size of the total populations at each period, this would have a tendency to reduce the proportion of deaths in early ages and *vice versa*.

This is the trend which is observed in the recorded cases (see Table XIII); but the change in the age incidence, as indicated by the proportion of patients at each age to the total patients under fifteen years of age, is so much more pronounced than the change in the age distribution of the population exposed to risk (see Table XIV) that it seems quite reasonable to assert that the decrease in the proportion of cases at ages under five years and the corresponding increases at ages over five years are due to factors other than the changing age distribution of the population.

THE VALUE OF TELLURITE MEDIA IN THE LABORATORY DIAGNOSIS OF DIPHTHERIA.

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(From the Queen's Memorial Infectious Diseases Hospital, Melbourne.)

RECENT literature shows an increasing tendency to stress the importance of the use of some type of tellurite medium as an adjunct to the routine use of Löffler's serum in the laboratory diagnosis of diphtheria.

The three types of *Corynebacterium diphtheriæ*, types *gravis*, *mitis* and *intermedius*, may be recognized with ease on this medium. Of these types *mitis* is a quick grower on Löffler's serum, it is distinctive morphologically, and it it most unlikely to be passed over in a smear from the culture. On the other hand, types *gravis* and *intermedius*, especially the latter, are not so easy to identify. They tend to grow slowly on Löffler's medium and differ from type *mitis* in frequently not attaining their characteristic morphology after the usual overnight incubation (fifteen to eighteen hours). The reincubation of the culture tubes may lead to an overgrowth of other organisms, again making the identification of the bacilli difficult.

The resemblance of the short, barred type *intermedius* to the Hofmann bacillus causes fresh difficulty, and with some nasal swabs the occurrence of diphtheriods may make impossible even a tentative opinion from a Löffler slope. The use of a tellurite medium in conjunction with the latter obviates most of these disadvantages.

In this hospital this has been evident, particularly in recent months. In August, September and October, 1940, of 177 cases in which swabs were examined for organisms of diphtheria, 32 were due to type *gravis*, 90 to type *intermedius* and 55 to type *mitis*. Of a corresponding number of cases during the same months of 1939, 13 were due to type *gravis*, 24 to type *intermedius* and 140 to type *mitis*. All these strains were tested for their fermentation reactions in glucose, saccharose, maltose and starch, and virulence tests were carried out. The *mitis* and *intermedius* strains were serologically typed, but the difficulty of obtaining satisfactory emulsions prevented us from typing

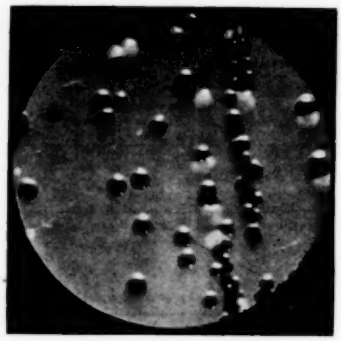

FIGURE I.
Corynebacterium diphtheriæ, Type *mitis*, and *Corynebacterium hofmanni*, 18 hours' incubation. × 14.

gravis strains consistently. The cultures were mainly from patients admitted to hospital with clinical diphtheria, the illness ranging from "mild" to "very severe", and a small proportion were from patients admitted to hospital after the discovery of diphtheria bacilli in throat or nose swabs. It was found that in a number of these cases it was impossible to give a definite opinion on smears from Löffler's serum slopes after fifteen hours' incubation, whereas by the use of a tellurite medium a positive result, generally with the type, could always be reported in that time. Individual colonies could be picked for fermentation reactions, virulence tests *et cetera*; this effected a saving of twenty-four hours for a complete report in a doubtful case.

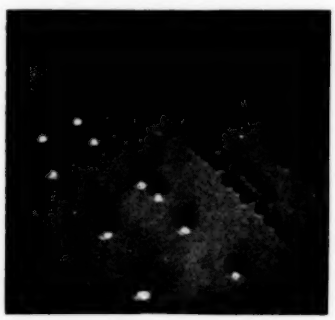

FIGURE II.
Corynebacterium diphtheriæ, types *mitis* and *intermedius*, 18 hours, incubation. × 14.

It is stated in *The Lancet*[1] of May 11, 1940, that "the disadvantages of all media containing tellurite are the delayed growth of the diphtheria bacillus and the great difficulty of microscopic diagnosis from them". In our experience not all tellurite media have these disadvantages. We have used various types over a number of years, and have found that a medium originated by one of us (A.H.) in 1938 gives rapid growth and characteristic microscopic appearances.

On this medium, by means of a plate microscope, colonies may be picked for subculture in ten to twelve hours. With a little experience *mitis* and *intermedius* colonies may be recognized in this time and are quite distinctive. Type *gravis* is the slowest to show its characteristic appearance, but this is usually definite in twenty-four hours.

In fifteen hours type *gravis* grows in slightly irregular colonies, approximately two millimetres in diameter, with somewhat crenated edges. The colonies are grey in colour and rather darker towards the centre. In thirty hours

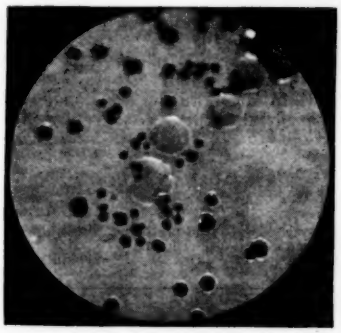

FIGURE III.

Corynebacterium diphtheriæ, types *gravis* and *intermedius*, 18 hours' incubation. × 14.

type *gravis* forms large colonies up to four millimetres in diameter. They are dark grey or black with an irregular outline, and have a granular surface with concentric striations.

Type *mitis* in fifteen hours forms small, regular, smoothly convex colonies measuring up to two millimetres in diameter. They are light grey in colour at the periphery shading to dark grey in the centre. In thirty hours the colonies are of similar appearance, though large (up to four millimetres in diameter), and their surfaces are shiny, reflecting light freely.

Type *intermedius* in fifteen hours forms small, discrete colonies, light grey in colour with a central black papilla.

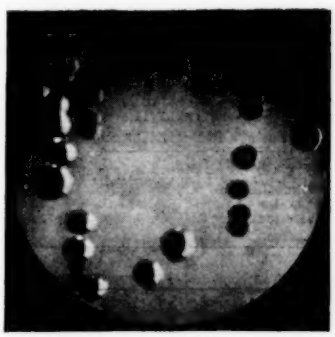

FIGURE IV.

Corynebacterium diphtheriæ, types *gravis* and *intermedius*, 24 hours' incubation. × 14.

In thirty hours the colony is still very small, rarely more than one millimetre in diameter, black in colour, with a rough surface and a central papilla.

Smears made from these colonies differ little from those from a Löffler's slope, the characteristic morphology of the *mitis* and *intermedius* strains being well shown.

The Preparation of the Medium.

The main points in the preparation of this medium are the use of unheated blood and the avoidance of undue heat at any time during its preparation. The procedure is as follows:

Fat-free good quality beef (500 grammes) is required, and 1,000 cubic centimetres of water are used. Finely mince the beef, add the water, and heat at 50° C. for sixty minutes, stirring from time to time. Extract through butter muslin, squeezing out as much as possible, and leave in the ice

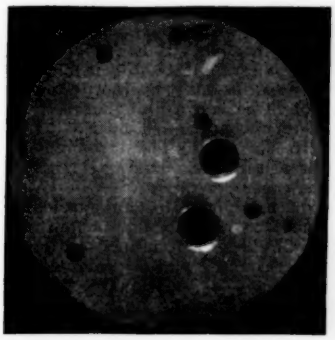

FIGURE V.

Corynebacterium diphtheriæ, types *mitis* and *intermedius*, 24 hours' incubation. × 14.

chest overnight. In the morning filter through paper and add 20 grammes of peptone (Witte, Berna, "Difco" or Fairchild's) and six grammes of sodium chloride. Stir at 45° C. until dissolved, and filter. Make up to 1,250 cubic centimetres with water.

The reaction of the fluid is then adjusted to pH 7·8, as follows. Heat 50 cubic centimetres in the steamer for fifteen minutes. Filter through paper and cool. Adjust the reaction of 10 cubic centimetres of this fluid to pH 7·8 with N/10 caustic soda solution. Then add to the bulk of the fluid the amount of N/1 caustic soda solution calculated on the basis of this titration. Filter into a three-litre flask and add 20 grammes of good quality powdered agar. Allow the agar to settle to the bottom without agitation. Heat in the steamer for forty-five minutes and check the reaction which, if good quality agar has been used, should be pH 7·7, the desired final reaction. Filter through a thin layer of

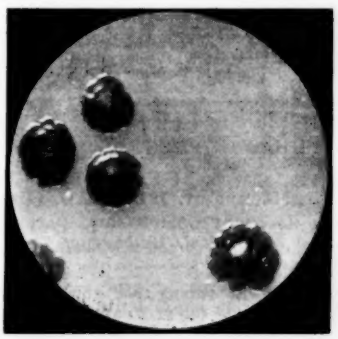

FIGURE VI.

Corynebacterium diphtheriæ, type *gravis*, 48 hours' incubation. × 14.

sterile absorbent cotton wool, filtering amounts of 300 cubic centimetres into sterile 500 cubic centimetre flasks. Heat in the steamer for twenty minutes and store in the cold room until wanted.

When the medium is required for use, melt one 300 cubic centimetre lot of agar in the steamer and cool to 50° C. To 30 cubic centimetres of defibrinated rabbit's blood add 6·5 cubic centimetres of a freshly prepared 2% solution

of potassium tellurite. Heat the blood tellurite mixture to 50° C. and add to the melted agar. Mix well by gentle rotation and pour into plates.

The following points require emphasis in order to obtain the best results. (i) Do not at any time raise the temperature of the medium to boiling point. (ii) Use sterile flasks, funnels and wool, so that the final twenty-minute steaming is sufficient to ensure complete sterilization. (iii) Be sure to allow all the agar powder to settle to the bottom before shaking. (iv) Filter through just enough cotton wool to remove the coagulated albumin and leave a smooth medium. Too much wool will render filtration very difficult. (v) Mix the defibrinated blood and the tellurite solution before adding them to the melted agar.

The medium is easy to prepare and may be stored in the cold room for long periods. It is economical, as a bleeding from one Australian rabbit is sufficient for from 30 to 40 plates and three swabs may be inoculated onto one plate of a diameter of three and a half inches.

Stored blood as recommended by Neal[2] (1937) may be substituted for fresh rabbit's blood, though we find that the colonies do not attain their characteristic appearances so quickly in that case.

The growth of most other organisms is inhibited, as in all tellurite media; but the few which grow are quite characteristic. Of these, Hofmann's bacillus usually forms small, smooth, round white colonies; diphtheroids, generally nasal, have a peculiar brown tint. A coarse staphylococcus forms smooth, round, black colonies of variable size, whereas *Micrococcus catarrhalis* occurs as rough, heaped-up, tough black colonies.

We have so far encountered only one strain of *Corynebacterium diphtheriæ*, isolated from a conjunctival lesion in a child, which grew on Löffler's serum and not on this medium. It fermented glucose and maltose, but not saccharose and starch, and was virulent for a guinea-pig.

Summary.

The necessity is emphasized for the use of a tellurite medium in addition to Löffler's serum for accurate laboratory diagnosis of diphtheria, especially when types *gravis* and *intermedius* are prevalent.

A simple form of tellurite medium is described, which gives rapid growth with satisfactory microscopic appearance of the bacilli.

Acknowledgements.

We are indebted to Dr. F. V. Scholes for his advice and to Captain John Watson for his help with this paper.

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(1) "Diagnosis of Diphtheria", *The Lancet*, May 11, 1940, page 886.

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SYPHILIS IN PREGNANT WOMEN.[1]

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I am presenting in this paper the results of routine Wassermann tests made on pregnant women attending the Queen Victoria Hospital, Melbourne. This investigation covers the consecutive results from July 1, 1932, to November 25, 1936 (Series I), and from July 1, 1937, to December 31, 1940 (Series II).

The procedure is to take blood for a Wassermann test on the patient's first visit to the ante-natal clinic. If the patient is admitted to hospital in labour as an emergency, the practice has been to collect blood from the umbilical cord for testing, and when this has failed to react to the Wassermann test the mother's blood has not been tested. Recent publications cast doubt on the value of cord blood reactions, though in most cases the cord blood reaction is the same as that of the mother's blood, owing to the reagins which pass across the placenta and so reach the fœtal blood stream. The number of "emergency cases" in this hospital, however, is small, and therefore the number of cases in which the cord blood only was tested is also small. For example, in Series II in a total of 4,300 cases only 64 results were from cord blood alone. In emergency cases of abortion the Wassermann test has not been carried out as a routine measure.

[1] Read at a meeting of the Section of Gynæcology and Obstetrics of the Victorian Branch of the British Medical Association on February 20, 1940, at Melbourne.

Incidence.

The general incidence is shown in Table I. It is surprisingly low, being about 0·80%. There appears to have been a slight drop in the incidence when the first series is compared with the second series.

Table I.
General Incidence of Syphilis.

Group of Patients.	Total Number of Patients.	Positive Reaction to Wassermann Test.	Probably Not Syphilitic.	Probably Syphilitic.
Series I	9,364	96 (1·02%)	18 (0·19%)	78 (0·83%)
Series II	4,300	37 (0·86%)	5 (0·12%)	32 (0·74%)
Total ..	13,644	133 (0·98%)	23 (0·17%)	110 (0·80%)

Some further details of the cases in Series II can be given. Of the 4,300 patients in this series, 4,002 were delivered of viable fœtuses, and 298 had miscarriages or disappeared. A few patients in the period under review escaped a Wassermann test by error. There were 67 of the latter in a total of 4,069 patients delivered of viable fœtuses.

The heading "positive" in Table I includes all cases in which a positive or partial Wassermann reaction was obtained, as well as a few cases of syphilis in which treatment was still being carried out and in which the blood had ceased to react to the Wassermann test as a result of treatment.

Table II shows the details of patients probably not syphilitic. The blood serum of all these patients gave "doubtful" reactions to the Wassermann test, or one positive reaction followed by an absence of reactions to subsequent tests. None of the patients gave a history suggestive of syphilis and none showed any signs of syphilis.

Table II.
Patients Probably Not Syphilitic.

Group of Patients.	Doubtful Reactions to Wassermann Test.	Positive Followed by no Reaction to the Wassermann Test.	Total.
Series I ..	11	7	18
Series II ..	2	3	5
Total ..	13	10	23

Table III gives the clinical types of condition in cases of probable or definite syphilis. In Series I a separate group had to be made for cases in which only one strongly positive reaction was obtained to the Wassermann test. The reason for this group is that, unfortunately, no fewer than 20 patients whose blood serum gave a strongly positive reaction either disappeared or were overlooked. Many of these patients failed to return after one visit to the ante-natal clinic. It was owing to these cases, as well

TABLE III.
Patients Probably or Definitely Syphilitic.

Group of Patients.	Secondary Syphilis.	Latent Syphilis.	Congenital Syphilis.	History of Previous Treatment.	Under Treatment At Onset of Pregnancy.	One Positive Reaction Only. No Subsequent Tests Made.	Total.
Series I	1	48	3	6	0	20	78
Series II	2	23	1	2	4	0	32
Total	3	71	4	8	4	20	110

as to the desire to institute treatment as soon as possible, that a special follow-up system was introduced. This will be referred to later. It will be noticed that in Series II this group has ceased to exist. In all the latent cases strongly positive reactions to the Wassermann test were obtained on several occasions. Some of the infections may have been congenital, but cases were labelled congenital only when definite congenital syphilitic lesions were present. Patients who had had previous treatment but whose blood serum still reacted to the Wassermann test, are put in a separate group from patients actually having treatment at the onset of this pregnancy. It will be noted that patients with latent syphilis are greatly in the majority. In connexion with the duration of the disease it is interesting to know the response given by the husband's blood to the Wassermann test. There were 32 patients in Series II, and 16 husbands had Wassermann tests of their blood made. The blood serum of 14 failed to react and that of two gave strongly positive reactions; the wives of these two were the patients with secondary syphilis. Of these 32 patients, 31 were married and one was single; 23 were *multigravidæ* and nine were *primigravidæ*.

Comparison of Incidence in Australia with Incidence Elsewhere.

The only published figures for Australia as regards syphilis in pregnancy are those of Fowler.[1] Up to 1921 he found an incidence of 10·7% in women attending the Women's Hospital, Melbourne. These tests, however, were not carried out on every woman attending the obstetric department, and so may be loaded by some patients picked out for tests on account of a suspicious history.

There are many American statistics concerning syphilis in pregnancy. Among the more recent ones are the following:

Speiser[2] in 1938 reported the presence of syphilis in 4·08% of 11,983 women consecutively confined at Bellevue Hospital, New York.

Daily[3] found that syphilis was present in 4·7% of 3,567 cases at Long Island College Hospital Obstetric Clinic from 1934 to 1937.

Halloran,[4] in 1939, reported that syphilis was present in 2·04% of 35,594 cases in the Los Angeles Maternity Service over a ten-year period.

Thus there is an incidence of 2% to 4% in parts of America. In other parts, however, higher figures are shown, particularly where there is a large Negro population.

Results.

Table IV indicates the outcome of the pregnancy, though conclusions cannot be drawn from such small numbers. The length of treatment before delivery was variable. The two miscarriages in cases in which treatment was given, occurred after one and two injections respectively of arsenic and bismuth about the third month of pregnancy. The two stillborn infants in the cases in which treatment was given, were from two mothers who had not had what is now regarded as efficient treatment before delivery. I have not been able for several reasons to assess the number of definitely uninfected babies among the living children. In the first series many of the babies could not be traced. In the second series most of the babies have been given antisyphilitic treatment from birth, except in a small number of cases in which the mother had been treated from the fourth month of pregnancy or earlier till delivery. In the last cases, which are still being followed up, every baby has apparently escaped infection. Many babies have probably been treated unnecessarily, and for the future I am not as a routine measure treating the baby, but am adopting the American scheme of watching the baby carefully for signs of congenital syphilis, making quantitative Wassermann tests frequently and taking X-ray photographs of the long bones. The umbilical cord is also examined for spirochætes. A positive reaction to the Wassermann test obtained from the blood of the new-born baby may be due to reagins transmitted via the placenta; but in this case the titre of the serum will fall till the reaction ceases to occur. On the other hand, an early absence of reaction to the Wassermann test does not mean an uninfected baby, as a positive reaction may take time to develop. The baby must therefore be seen at frequent intervals up to the age of six months and afterwards less frequently. Antisyphilitic treatment is, of course, instituted at the first indication that infection has passed to the baby. (Christie,[5] Davies.[6])

TABLE IV.
The Outcome in Cases Regarded as Syphilitic.

	Series I.[1]		Series II.[2]	
	Treated.	Untreated.	Treated.	Untreated.
Number of patients	37	17	26	4
Miscarriages ..	—	—	2	1 (induced)
Live babies ..	36	15	23	1
Number of babies stillborn or dying in early neo-natal period	1[3]	2[3]	1[3]	2[4]

[1] Of 78 patients, 24 disappeared before delivery.
[2] Of 32 patients, two later had private treatment and were not delivered in the hospital.
[3] Stillborn.
[4] Lived a few hours.

Discussion.

Certain accepted facts emerge from a study of the literature.

1. Spirochætes have not been proved to traverse the placenta from mother to fœtus before the end of the fourth month of pregnancy; spirochætes have not been found in products of conception before that date. (Levaditi,[7] Hoffmann.[8])

2. Arsenic has been proved to traverse the placenta in the latter half of pregnancy. It has been found in human fœtuses expelled in the latter part of pregnancy and also in the meconium of the new-born babies of mothers who have had arsenic therapy. (Snyder and Speert.[9])

3. If treatment is begun prior to the fifth month of pregnancy and continued throughout, it should prevent infection of the infant. (Speiser[2] at Bellevue Hospital found that when the mother had had 15 injections of

"Novarsenobillon" during pregnancy the infant was free from syphilis.) Even late treatment is worth while, as it greatly reduces the fœtal death rate and may prevent infection of the infant. Arsenic is specially important in the last two months. (McCord.[10])

Scheme for Treatment.

To secure the ideal of early treatment, pregnant women should be encouraged to visit the ante-natal clinic in the first trimester of pregnancy, and blood for a Wassermann test should be taken at the first visit. It has been my experience that half the value of performing routine Wassermann tests in pregnancy is lost unless there is a definite scheme for "chasing" the positive reactors. The proof is here. In Series I only 37 of 78 patients were treated during pregnancy, and in many cases there was a long interval between the blood tests and the commencement of treatment. (Twenty-four patients in this series were lost sight of altogether; they were not delivered in hospital.) In Series II all patients were treated except those who came as "emergency cases" at the end of pregnancy. By a process of stopping-up loopholes therefore the present scheme has been evolved at the Queen Victoria Hospital, by which all syphilitic patients receive treatment as early as possible in pregnancy.

Blood is taken for tests on the first visit to the ante-natal clinic. The medical superintendent's secretary receives all results of Wassermann tests, and it is her duty to enter them in a book whence they are copied on the the ante-natal charts of patients. When a reaction is positive or doubtful the secretary also writes immediately to the patient concerned asking her to attend at the hospital on the following Thursday at 2 p.m. At the same time she enters the result of the test in red ink on the ante-natal chart and also puts the patient's name in a special book which is kept in the syphilis clinic, so that if the patient does not come for treatment within a week inquiries can be made about her. When the patient comes another sample of blood is taken for a Wassermann test to check the first result. She is also reexamined and carefully questioned to find out whether she has ever had any symptoms or signs suggestive of syphilis, or whether the family history is relevant. On this occasion treatment with "Novarsenobillon" and bismuth is begun so that no time is wasted. If the original positive Wassermann reaction is not confirmed, and if there is no clinical evidence or history of syphilis, then a third test is carried out; if this also produces negative results, treatment is not continued, but the cord blood is tested on delivery. Under this scheme the patient begins treatment within two weeks of her first visit to the ante-natal clinic.

The scheme of treatment for pregnant patients is a continuous one. If the diagnosis is not made till the last three months of pregnancy, concurrent weekly injections of "Novarsenobillin" and bismuth are given; if the diagnosis is made earlier, overlapping "Novarsenobillon" and bismuth courses are used.

It makes for efficiency to have this treatment in the hands of someone associated with the obstetric staff, who can and will follow the patient to the wards when she is admitted to hospital and observe the baby after birth.

A system of checking over at frequent intervals all cards in the syphilis clinic is essential for the detection of any patients not attending for treatment. Anyone not attending is written to and asked to come the following week. If she fails to come another letter is sent, stating that her name will be reported to the Department of Public Health if she does not attend. Defaulters are reported. Actually, patients while pregnant usually attend for treatment very regularly.

Conclusion.

Though the incidence of syphilis in our population at present would appear to be low, yet, particularly in these days of a low birth rate, considerable trouble seems well worth while if it means the saving of even a few babies from death or later serious disabilities. Undoubtedly the eradication of congenital syphilis lies largely in the hands of the obstetrician.

Acknowledgements.

I wish to acknowledge the generous support and cooperation of the honorary obstetricians at the Queen Victoria Hospital, without which the scheme outlined could not have been put into practice. All the Wassermann tests have been carried out by the bacteriology department of the University of Melbourne, and I should like to express to Dr. Sara Gunderson especially my appreciation of her help. Finally, my thanks are due to Miss Bryant, of the records office at the hospital, for her great help in tracking down some of the more elusive cases.

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THE TECHNIQUE AND APPLICATION OF BLOOD TRANSFUSION AND PLASMA TRANSFUSION.

By D. L. Barlow, M.C., E.D., M.D., F.R.A.C.P.,
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Owing, no doubt, largely to the emergency conditions, greater interest has recently been aroused in transfusions; this article aims to pass on a few suggestions which may be helpful to others with special interest in this field. In civil life these measures are even yet insufficiently utilized, apparently for the following reasons:

(i) The value of transfusion in conditions other than acute hæmorrhage and shock is insufficiently appreciated; the immense improvement in the outlook of an anæmia patient who has to undergo an operation may be quoted as an example. If possible, the hæmoglobin value should be raised over 90%. (ii) When a specialist is not available, difficulties of blood grouping and technique are regarded as obstacles. (iii) Too much has been said about reactions, since, apart from mistakes in grouping, these are never dangerous and with proper methods rarely troublesome. Where complete testing is possible, a donor of the same group is always preferable to a so-called universal donor.

Blood Grouping.

For ordinary circumstances testing with serum of groups II and III to establish the group is desirable, but should be supplemented by direct testing of the patient's serum against the donor's corpuscles, and *vice versa*, in test tubes incubated for an hour. However, in an emergency, and when reliable specimens of testing serum are not available, the direct testing of the patient's serum with the donor's blood cells on a glass slide will suffice to eliminate dangerous incompatibility. It is dangerous to rely on old testing serum, as this may have lost its agglutinating

property. If a centrifuge is available, the donor's blood sample may be citrated and the plasma obtained in a few minutes; but a few drops of serum can usually be separated from coagulated blood within half an hour of collection. The presence of a few of the patient's red cells will not obscure the result of testing. Absence of agglutination indicates that the proposed donor's blood is of the same group as the patient or of group IV (Moss).

Methods of Collecting, Storing and Administering Blood.

A large calibre needle to which is attached one foot of pure rubber tubing, and a measure glass or jug containing sufficient sodium citrate solution to prevent coagulation, comprise the essentials for collection of blood for immediate transfusion.

Much has been said about the protection of the blood from contamination from the air by use of "closed" methods; but most of these involve contact with unfiltered air. With reasonable precautions against droplet infection and dust particles, there is no risk from the use of the open method. Nevertheless, the reception of the blood in a suitable bottle or flask by means of a glass tube through a perforated rubber stopper, instead of into an open vessel, has advantages, and when the blood is to be transported or stored for later use, such a method is essential.

A number of different methods of capping such bottles, prior to use and during storage, have been devised; but each has certain practical shortcomings which have been eliminated in the apparatus depicted in the accompanying sketch.

A rubber stopper with two perforations is retained in place, even when the bottle is inverted to run the blood to the patient, by means of a metal screw top which has a hole one inch in diameter in its central part; this allows access to the perforations in the stopper. To prepare the bottle for use, the stopper is inserted and covered by a disk of sheet rubber over which a metal disk is placed and the screw cap loosely fitted. After autoclaving, the cap is screwed down firmly and the bottle is ready for use.

When blood is to be collected the cap is taken off and the metal and rubber disks are removed, the glass tube connexion to which are attached the needle and rubber tubing, is inserted through one hole in the stopper, and a tube connecting with a rubber suction bulb is fixed into the other hole. The last-mentioned tube should have an air filter between the bottle and the suction bulb.

When the needle is being introduced into the vein the skin should be pulled aside from the vein and punctured first; then when the needle point has been manœuvred over the middle line of the vein, this should be entered in a downward or distal direction. It may be mentioned in passing that there is little practical advantage in the use of French's needle; a short needle of adequate bore and well sharpened is what is required. With such a needle, and when the bottle is kept at a lower level than the donor's arm, little use of the suction pump is required.

When the collection of the blood is completed, if it is to be used immediately, after the tubes have been taken out of the perforation in the stopper the cap is replaced and screwed down firmly. A small piece of glass tubing is now fixed in one perforation carrying a rubber connexion and needle for conveying the blood to the patient. Through the other hole a glass tube is inserted almost to the bottom of the bottle, and of such a length that about an inch projects from the stopper. The bottle is now inverted and elevated by means of a suitable stand, and after the tubing and needle have been completely filled with blood, the needle (size B-D 16) is inserted into the vein at the front of the elbow.

If the blood is to be stored, after the connecting tubes have been withdrawn from the stopper at the completion of the collection of the blood, a sterilized rubber disk is replaced, then the metal disk, and the cap is screwed in place; the blood is now ready for storage in a refrigerator.

In giving the blood to the patient it is always desirable to do so without dissecting a vein and tying in a cannula, unless the drip method is indicated. However, when the patient is in a state of collapse it may be almost impossible to accomplish this except by the use of so fine a needle that great difficulty will be experienced in getting the blood through it in reasonable time. It is in just such cases that it may be necessary to give the blood as rapidly as it is safe to do so. In such circumstances the skin over the vein should be incised and the vein picked up by means of a miniature artery clip. A good sized needle can now be inserted into the lumen of the vein. Several types of vein seekers have been described to aid in entering a vein through the skin; but when difficulty is experienced the above method has little disadvantage, as the vein is not subsequently obliterated.

For immediate transfusion, after the blood has been collected in a suitable measure, a long graduated funnel with tubing and a needle can be used for the patient. In this case it is best to put 50 cubic centimetres of saline solution in the apparatus, then after puncturing the skin beside a suitable vein, to lower the funnel whilst the vein is being entered. The successful entry will then be obvious, owing to the flow of blood back into the transparent rubber tubing. The funnel is now raised and filled with blood, the top is covered with a sterile metal cap which fits loosely, and the funnel is suspended at a height adjusted to give the correct rate of outflow. A slow rate is desirable in all cases other than those of urgency (hæmorrhage and shock); when it is desirable to give large quantities as quickly as possible, the drip method should be used. The chief indication for this is severe anæmia in a patient requiring an operation. To employ the drip as a more or less routine method is unnecessarily irksome to the patient and inevitably causes obliteration of veins.

The Use of Plasma.

Recently it had been shown that after acute hæmorrhage the giving of 500 cubic centimetres of plasma is followed within an hour or two by an increase in hæmoglobin value in the region of 10% of the normal figure;[1] in any case, the serious factor in hæmorrhage is not the loss of cells (I have seen patients in my consulting rooms with hæmoglobin values around 30%), but the loss of plasma. Thus it is easy to understand why, in cases of moderately severe hæmorrhage, plasma transfusion appears to be almost as effective as that of whole blood. As plasma can be kept in a refrigerator for months, whilst about two weeks are the limit for blood, the advantage is obvious, especially in a war zone. In addition, as shock results in loss of plasma from the circulation and in concentration of corpuscles, with a rise of hæmoglobin value, it is obviously a much sounder practice to employ serum or plasma in combating this condition. Transfusion of whole blood in pure shock is effective, but it should now become the second preference in such cases. The best guide in doubtful instances will be the hæmoglobin estimation. Repeated estimations of the value in severely injured persons will

often show that the blood is becoming concentrated by loss of fluid; thus before the fall of blood pressure and collapse develop, the indication for plasma transfusion becomes manifest, and treatment is instituted before it is too late to be effective. Such repeated observations should be particularly useful when patients have lost some blood and are also suffering from traumatic shock. In these cases one factor tends to lower the hæmoglobin value and another tends to raise it, and an original estimation showing a value near normal may be deceptive. Plasma transfusion is indicated also when the object is to raise resistance to infection, but in these circumstances fresh plasma should be used. Its use in my practice on a number of occasions has been marked by rapid improvement in cases of severe streptococcal infections; but now that chemical remedies are available there will be less indication for this method.

The Storage of Blood and Plasma for Civilian and Military Purposes.

Every city should have at least a small supply of group IV blood in storage at all times for very urgent cases. The saving of time will sometimes mean saving of life. If any particular bottle of blood is not used within seven to ten days, the plasma should be removed aseptically and stored in a refrigerator. With such a system practically no waste should occur, as the demand for plasma will rise as its value becomes more widely appreciated. For military purposes mobile refrigeration storage plants are sent to the forward area, and no doubt much of the stock will be plasma or serum. Not only will this be as effective as the sending of whole blood alone, but it will eliminate much waste and allow of the building up of large plasma reserves for a time of intense activity.

In addition to having supplies of blood and plasma available for the storage plant (or bank), field ambulances should have the simple apparatus for emergency transfusions in case they should be temporarily cut off from stored supplies.

With regard to anticoagulant solution for blood intended for preservation, simple sodium citrate solution is adequate if the above programme is adhered to.

Unfortunately an idea has become rather widespread that the shaking up of blood in transport damages it, presumably owing to hæmolysis. It is important to realize that this is not the case, as otherwise important opportunities of collecting supplies of blood may be wasted. An example of this has recently come to my notice. Reports from the special transfusion officers with the British Expeditionary Force in France have completely confirmed this opinion. A considerable amount of shaking up of stored blood was inevitable in the evacuation period, but no untoward results occurred.[2]

The Preparation of Sodium Citrate Solution.

Ordinary distilled water is shaken up with fine powdered animal or vegetable charcoal (one gramme per 100 cubic centimetres) and then filtered.[3] The citrate is then dissolved and the solution sterilized by being passed through a Seitz filter. In this way traces of organic matter and microorganisms are adsorbed or filtered off. This solution is kept in a refrigerator until required.

Advantage of the Apparatus Described.

The advantages of the apparatus described appear to me to be as follows: (i) It is simple and does not require numerous specially made fitments. (ii) It is adaptable, being suitable for storage as well as for immediate transfusion. (iii) Since the use of a needle at the bottle end of the blood-collecting tube is eliminated, the flow of blood is facilitated. This is desirable, as slowing down favours trouble with coagulation in the collecting tube or needle. (iv) No tube is left in the stored blood, as in one type of bottle. Such a practice has the disadvantage of encouraging formation of small clots.

Summary.

1. Blood transfusion is not yet employed sufficiently in civil practice.

2. Simple methods of testing and of carrying out transfusion in emergency are described.

3. A bottle with a special type of cap *et cetera*, which is useful for immediate transfusion for the drip method and for storage, is described.

4. A rapid and reliable method of preparing sodium citrate solution free from pyrogens is mentioned.

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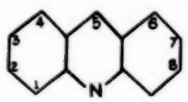
RECENT ADVANCES IN THE USE OF ACRIDINE ANTISEPTICS.[1]

By Adrien Albert, Ph.D. Med. (London), B.Sc. (Sydney), *Sydney*.

The familiar acridine antiseptics, proflavine, acriflavine and euflavine, form a series of yellow dyes synthesized from benzene and containing the nucleus shown in Figure I. Their powerful bacteriostatic properties were



ACRIDINE

Figure I.

discovered by Professor Carl Browning, curiously enough, on the eve of the outbreak of a war (1914) which afforded opportunities to confirm his results on a large scale; for his two most active compounds, proflavine and acriflavine, came to be widely used by the Allied forces with excellent results. The former substance is the purified 2:8-diamino derivative of acridine, whilst acriflavine is a crude preparation of proflavine mixed with its methochloride.

The unrivalled position occupied by the acridines in the treatment of casualties is due to their unique property of preventing the growth of all types of pathogenic bacteria without suppression of phagocytosis. This property is maintained even at extreme dilution and in the presence of organic matter.[1] Although minor injuries are often treated with phenols, mercurials or iodine, such substances are either inactivated by dilution (iodine) or by protein (mercurials) or not active against some common pathogens (chlorinated phenols) and they are all harmful to leucocytes.[2] It is therefore customary to use the "flavines" when a large extent of tissue has been exposed to contamination, such injuries occurring in industrial and road accidents and in the deep infected wounds sustained on the battlefield. The plaster-immobilization treatment is often used for war wounds, and Ogilvie has recently recommended a prior application of a 0·1% proflavine solution.[3]

In 1937 the team in which the present author was working determined[4] the average lethal doses of these drugs and showed that acriflavine (average lethal dose 0·05 gramme per kilogram) was four times as toxic as proflavine (0·2 gramme per kilogram). Browning had always insisted that proflavine was as good an antiseptic as acriflavine, and this has since been confirmed by several workers. In spite of this, acriflavine was always preferred by dispensers, who found it easier to dissolve. This is, however, a minor point, when one considers that proflavine is a pure chemical whose purity can be rapidly checked from the melting point, whilst acriflavine

[1] From the Drugs Subcommittee of the Association of Scientific Workers.

is a crude mixture of variable composition which can be checked only after tedious fractional precipitations. In view of all these facts, it is not surprising that proflavine has been preferred to acriflavine in recent medical literature Professor Garrod, for example, writes as follows:[2]

> Because of its constancy of composition and of its minimal toxicity—and, it may be added, of its relative cheapness, for its synthesis is a simpler process than that of acriflavine—proflavine is the antiseptic of choice.

Specially significant are the findings of Russell and Falconer,[5] who undertook research to discover whether antiseptics could safely be applied to the brain in the treatment of war-time head injuries. They found that acriflavine, like the majority of antiseptics, caused hæmorrhage and necrosis of the brain, but proflavine was little more harmful than isotonic saline solution. They came to the following conclusion:

> We therefore feel that in recommending proflavine sulphate (0·1% in isotonic saline buffered to pH 6·2) for application to wounds of the brain, we are supporting an antiseptic which is both potent against bacteria and yet innocuous to the tissues.

Manifold[6] reached similar conclusions as a result of independent work on brain tissues.

The present writer has been engaged since 1934 in synthesizing acridine compounds and in studying the connexion between their antiseptic properties, on the one hand, and their physical and chemical properties on the other. This work led to the discovery[7] of a red substance, 2:7-diaminoacridine, that is as antiseptic as proflavine and acriflavine, yet has only one-tenth of the toxicity of the latter.[8] Unfortunately, it has been, up to the present, a very difficult substance to make in quantity, and it can not yet compete with the commoner acridines on an economic basis. However, it has recently been shown[9][10] that this substance is, of all known antiseptics, the least injurious to the living brain, even excelling proflavine in this respect.

Accordingly, research into more economical methods of preparing this and other acridine compounds is being carried out at the University of Sydney. An interesting result recently obtained here is the synthesis of 5-aminoacridine by a new method.[10] This substance is colourless in solution and hence eminently suited for the treatment of lesions of the face and fauces. Tests performed at the University of Melbourne[10] have shown that it is similar in its toxicological and antiseptic properties to acriflavine and proflavine. It is possible that this substance could now be made available for clinical trials.

A considerable amount of research has also been performed here in connexion with the reactions by which proflavine is produced,[11] and the Drugs Subcommittee of the Association of Scientific Workers has been instrumental in adapting the experiments to large-scale practice. As a result of this work it is now established that Australia's total war-time requirements of proflavine (or acriflavine) can readily and economically be produced from raw materials available locally.

The above references to proflavine concern its water-soluble form, the sulphate; but there is also an oil-soluble form, the oleate, which Bonney introduced in 1919. After four years' experience with this substance, Young and Charteris[12] have recently reported its value in the prevention of septic developments during the application of radium to the nasal sinuses. This oleate could also be prepared in Australia.

Since the substances dealt with in this paper are neither patented nor proprietary articles, they have not been extensively advertised and so their importance is easily lost sight of. Nevertheless, employment of the various acridine antiseptics in peace and war has yielded results of such outstanding value that further successes may confidently be expected.

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Appendix.

The following notes on the prescribing of proflavine are adapted from "Some Proflavine Formulæ", by Adrien Albert and Cyril Bennett, published in *The Australasian Journal of Pharmacy*, Volume XX, 1939, at page 775.

Proflavine Lotion.

Proflavine	.. ..	0·1 gramme	.. 1 grain
Distilled water to		100·0 mils	.. .. 2 fluid ounces

To be dispensed in an amber-glass bottle, as it is affected by sunlight.

When required for unbroken skin, acetone 25·0 mils (half a fluid ounce) or alcohol 50·0 mils (one fluid ounce) may be added to improve the wetting and spreading properties. When required for extensive wounds, sodium chloride 0·9 gramme (8 grains) may be added to render isotonic.

Proflavine Greaseless Ointment.

Proflavine	.. ..	0·1 gramme	.. 1 grain
Starch	.. .. ..	1·5 grammes	.. 13 grains
Tragacanth	..	1·5 grammes	.. 13 grains
Glycerin	.. ..	50·0 mils	.. 1 fluid ounce
Distilled water to		100·0 grammes	to 2 ounces (by weight)

The starch and water (50) are to be rubbed smooth in a dish and then boiled. The tragacanth, proflavine and glycerin are to be triturated together, the starch jelly incorporated and the product adjusted to weight with water.

Tannic Acid and Proflavine Greaseless Ointment.

Tannic acid	..	8·0 grammes	.. 35 grains
Proflavine greaseless ointment to produce	.. .. ..	100·0 grammes	to 1 ounce

This preparation has been found effective as a first-aid dressing for burns.

Reports of Cases.

REPORT OF A CASE OF TUBERCULOSIS AND CANCER.

By Guy Griffiths, M.D., F.R.A.C.P.,

Honorary Consulting Physician, Royal North Shore Hospital of Sydney.

Clinical Record.

In April, 1929, Mr. O.B. stated that he was fifty years old and that he had been ill for two years with cough

and expectoration and had lost a stone in weight; he had been radiologically examined, but nothing was found; he had had a holiday at Moss Vale and another at Moree, but grew worse, and would go no more to the country but continue his work as a public servant in Sydney. He had had a second X-ray examination, this time by Dr. H. R. Sear, who found a cavity in the upper lobe of the right lung and slight opacity in the left lung; the patient had then agreed to further rest and had been off duty for four months until April, 1929.

At this time he was tall, thin and wan; his weight was eleven stone one and a half pounds when he was fully clad; his pulse rate was 110 per minute, his respirations numbered 22 per minute and his temperature was 100° F.; he was languid and his appetite and digestion were poor; there were dulness, bronchial breath sounds and a few râles over the upper half of the right lung, and some, but slighter, signs over the upper lobe of the left lung; he had a little pain and a friction rub; his sputum was pink and contained tubercle bacilli; he was a little hoarse and his vocal cords were a little red and rough; he had a small ischio-rectal abscess.

With difficulty he was persuaded to take yet four more months' rest, but he refused to go to the country. He was treated with hypodermic injections of albumose-free tuberculin (T.A.F.), from 0·00001 cubic centimetre up to 0·06 cubic centimetre, and did well till he was upset by his daughter's illness (pneumonia and empyema) and by his mother's death. He then had bovine tuberculin (P.T.), from 0·001 cubic centimetre up to 0·08 cubic centimetre, and did very well, till in 1931 he had regained his lost flesh, weighed over twelve stone and said "he felt better than he had ever been in his life". His legs sometimes ached and he had occasional pleural pains. He did his work regularly except for his annual holiday at Blackheath.

In 1932 Dr. George Hamilton kindly examined him for a rodent ulcer of the face and treated him successfully with radium.

In August, 1932, he had some diarrhœa, but no tuberculosis of the bowel could be found; his cavity was unhealed but nearly dry. Early in August, 1933, he had vague abdominal pain with diarrhœa and a little vomiting. On August 20 he became worse; he had severe abdominal pain and there was tenderness in the right and also in the left iliac fossa.

Dr. Hunter Jamieson saw the patient in consultation and agreed with a tentative diagnosis of abdominal tuberculosis. He was admitted to the Royal North Shore Hospital of Sydney, and on August 22 Dr. Jamieson operated and excised an almost rigid appendix, which in one place appeared gangrenous. The patient sank and on August 25 he died.

Post mortem it was found that the appendix had been converted by the growth of epithelium from its mucous wall through the mucosa and other coats into a rigid, brittle tube about five inches long and half an inch in diameter. There were small metastases in the peritoneum, in the liver and in the lungs; recent non-tuberculous bronchopneumonia was present at the base of the right lung, and early general peritonitis was noted. There was a fibrous-walled cavity of the capacity of about three ounces in the right lung, and in this wall were at one place two small lesions which contained giant cells; otherwise the tuberculosis appeared to be healed. There were old calcareous nodules in the left lung, but no recent tubercles were found anywhere. Examination of the heart revealed some terminal myocarditis.

The honorary histologist reported that an adeno-carcinoma with scirrhous tendency had arisen in the mucosa of the appendix and had infiltrated the whole mucosa and all the coats, and that metastases of this were to be seen in the peritoneum, the liver and the vessels of the lungs.

Summary.

A case is described of ulcerative tuberculosis of the lung, and the occurrence, during treatment with tuberculin, of a curative fibrosis.

Later the patient suffered two attacks of cancer: first, a facial rodent ulcer which responded to treatment with radium, and secondly an adenocarcinoma of the *appendix cæci* with peritoneal and visceral dissemination, probably perforation and peritonitis; of this second cancer he died.

Reviews.

OCCUPATIONAL THERAPY.

As stated in the preface to "The Theory of Occupational Therapy", by N. A. Haworth and E. M. Macdonald, this book is intended for students and nurses studying the methods of application of this form of treatment.[1] The title is somewhat of a misnomer, as the greater part of the book is devoted to the practical aspects of occupational therapy; for instance, fifty-two pages are occupied by illustrations of tools, charts, designs and the like. Unfortunately these illustrations are not explained sufficiently, and they are by no means self-explanatory; however, they serve admirably to illustrate a demonstration or lecture on the various crafts.

The book describes the application of occupational therapy to mental disorders, tuberculosis and cardiac diseases, and orthopædic and surgical conditions. As much discussion is devoted to these physical disorders as to mental diseases; in each section the authors stress properly the importance of making occupational therapy individual for each patient, as "the amount of help that a patient may obtain from occupational therapy depends . . . upon the occupational therapist; upon her tact, sympathy and power of understanding the patient's individual need". They also bring frequently under the notice of the student the too often forgotten fact that patients suffering from tuberculosis, cardiac diseases, or orthopædic conditions all have a "mental state" which merits consideration and frequently needs treatment.

Recreational therapy receives but scanty attention. This is unfortunate, as this aspect of occupational therapy is often invaluable. It is frequently more productive of results than occupational therapy proper, and it is free from the taint of commercialism that continually tends to obtrude in the application of occupational therapy in a large hospital.

DISEASES OF CHILDREN.

SIR ROBERT HUTCHISON has entrusted to the care of Dr. Alan Moncrieff the eighth edition of his well-known book on diseases of children.[2] As would be expected, Dr. Moncrieff, with his wide experience of editorship and fresh original outlook on many infant problems, has succeeded in making the relatively small volume even more attractive and a greater source of information to those interested in the care of children than ever before.

Without a noticeable increase in the book's size, two new lectures on infant feeding and another one on the care and management of the premature infant have been added by the junior author. Modern advances in diagnosis and treatment have been brought up to date.

Some points remain controversial, if not actually erroneous. Most observers, for example, would not agree that "rheumatic nodules are better felt than seen". Von Gierke's disease is uncomfortably grouped with the lipoid dystrophies. American surgeons will deny that congenital obliteration of the bile ducts is "entirely insusceptible to treatment". It is difficult to see how thrombosis of the splenic vein could cause dilatation of the œsophageal veins, since the latter do not drain into the former. Surely *Bacillus coli* frequently reaches the urinary tract by the blood stream and not rarely, as claimed by the authors. Further, it is difficult to be convinced that enlarged tonsils and adenoids should be included amongst the causes of inability to talk in spite of the case recorded.

But these are minor points and do not detract at all from the excellence of the book. The chapters on the digestive disorders of infancy and the dyspepsias of childhood still remain the most illuminating and instructive in the language. The large number of new illustrations added from the collection at Great Ormond Street leave nothing to be desired. The sections on diagnosis of such problems as "fainting attacks", "screaming in infancy", "insomnia", "bilious attacks", "enlargement of the abdomen" must still remain very useful to the harassed practitioner.

The book should be a valuable addition to the library of students, general practitioners and pædiatricians. But there is no need to discard a previous edition. Dr. Hutchison's inimitable style and sound clinical sense will, like that of his distinguished colleague Dr. Frederick Still, remain evergreen. Dr. Moncrieff, in his wisdom, has apparently gone to considerable pains to preserve as far as possible in its original form one of the recognized classics amongst the works in children's diseases.

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The Medical Journal of Australia

SATURDAY, APRIL 19, 1941.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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WAR-TIME INDUSTRY AND FATIGUE.

THAT the memory of man is short has been shown in the conduct of the present war on what is known as the home front. Munitions and guns have to be made, and ships, aeroplanes and motor vehicles have to be built. Many thousands of men and women are enrolled in the service of the State to do these things. Since munitions and equipment are urgently needed, and in enormous quantities, it is quite natural that those who control the industrial programme shall try to arrange for a maximum production and that the workers concerned shall be willing to give of their best and be content to work for long hours if it appears that the cause they are trying to serve will benefit. It has been argued in the past that if a certain amount of work can be done in two hours, double that amount will be completed in four hours and double the latter amount in eight hours. But man is not a machine; his efficiency in industry depends on many factors, but chiefly on his muscular and nervous systems. This was learned somewhat painfully in the war of 1914-1918, and in the present war the authorities in England have had to be reminded over and over again of the facts established in the earlier conflict. Any who may doubt the truth of this statement will be convinced by a perusal of the files of *The British Medical Journal* and *The Lancet* for 1940. There are indications that the facts about fatigue and industry are not being fully applied to Australian conditions. Australian medicine has a twofold interest in this subject. As ordinary members of the community Australian doctors want to be sure that the Commonwealth war effort is as full and complete as possible; they have also to safeguard the health and general welfare of the worker. In these circumstances it will be useful to make a short review of the main facts revealed by research, facts that have had to be reemphasized in Great Britain since the beginning of the present war.

In 1915 considerable anxiety was felt about the supply of munitions for the British forces, and the Committee on the Health of Munition Workers was set up to investigate the factors influencing supplies. It at once became apparent that, even when considered from the point of view of output alone, excessive hours of work did not pay. In direct succession to this committee came the Industrial Fatigue Research Board. This body, which is now known as the Industrial Health Research Board, is part of the organization of the Medical Research Council of the Privy Council; its duties are defined in the following terms of reference:

> To suggest problems for investigation, and to advise upon or carry out schemes of research referred to them from time to time by the Medical Research Council, undertaken to promote better knowledge of the relations of methods and conditions of work to the functions of the human body, having regard both to the preservation of health among the workers and to industrial efficiency; and to take steps to secure the cooperation of industries in making widely known such results of this research work as are capable of useful application to practical needs.

Since the establishment of the Industrial Fatigue Research Board research has been carried out continuously, and 84 numbered reports have been published by His Majesty's Stationery Office, as well as several joint reports and also some special reports. In March, 1940, the Industrial Health Research Board issued what is known as Emergency Report Number 1, entitled "Industrial Health in War" and containing "a summary of research findings capable of immediate application in furtherance of the national effort". The report was described in a leading article in *The British Medical Journal* of April 13, 1940, to which most medical practitioners in Australia have access, and it is a pity that at so late a stage in the present conflict it should be necessary to restate in Australia what are really fundamental truths. Emphasis should be laid on the following statement from the preface of this first Emergency Report: "The need at the moment is rather for application of knowledge previously gained than for new researches—although fresh problems for investigation may present themselves as the war proceeds."

In the section of the report dealing with fatigue it is pointed out that there is no doubt that within certain limits an increase in the hours of labour will increase the output—in six hours more work can be done than in five or four. The problem has been to discover the best length of the working day. "In simple terms, if nine hours' work produces nine times as great an output as does one hour, will ten, eleven and twelve hours produce ten, eleven and twelve times as much?" It was found that a twelve-hour day produced no more than a ten-hour day. The following striking example is given. Reduction from 58·2 to 51·2 in the actual weekly working hours (the nominal hours of work less the time lost for various reasons, such as waiting for work) of a group of fifty-six men, engaged in the heavy labour of sizing fuse bodies, increased the total output by 22%. In other words, when the men actually worked 58·2 hours (nominally 66·7) the relative hourly output was taken as 100 and the gross production as 100; when they worked 50·5 hours (nominally 62·8) the relative hourly output was 122 and gross production 106; when they worked 51·2 hours (nominally 56·5) the relative hourly output was 139 and the gross production 122. At the time when the Health of Munition

Workers Committee was set up in 1915 hours of labour for men had been increased; seventy to ninety hours a week were common, and over ninety hours were not infrequent. When the committee recommended that working hours should be reduced, it emphasized the view that there should be no interference with Sunday rest and ordinary holidays. Since the last war the Industrial Health Research Board has carried out in the steel and iron, glass, shell-making and laundry trades observations which confirm the war experience. These may be summed up shortly in the following three statements: (*a*) An extension of the usual hours of work does not, except for short periods during an emergency, give a proportional increase of output; on the contrary, it causes the output to fall off with increasing rapidity. (*b*) After a continuous period of overtime, improvement in output rate does not take place for some time after the reintroduction of shorter hours. (*c*) An unbroken spell of four and a half to five hours is generally too long—"man must rest, even at work". Organized rest pauses are much more effective both to efficiency and health than are periods in some kinds of work in which a man can "stand easy" from time to time. In a section of the report dealing with fatigue and recovery it is pointed out that the stages at which full success in continuous activity is replaced by partial success and eventually by failure, are not the same for everyone nor constant for the same person. From this observation it is shown that the basic problem is one of health—health of mind and body—"since the healthier and more contented the individual, the more energy he has available". Though the commonest cause of the onset of fatigue is long-continued overtime without adequate rest or holiday, even with reasonable hours inadequate management may of itself have the same result. The remedy for fatigue is rest, and if work has been within reasonable limits, a night's rest may restore energy. When fatigue has been prolonged, however, even a limitation of hours does not result in a normal output for a number of weeks. Among other aspects mentioned in this part of the report are boredom and the measures that may be taken to alleviate it, the arrangement of work so that unnecessary movements and effort are eliminated, and the appearance of danger signals, such as an increase in absence due to illness, accidents and labour wastage. So far only the first section of this report, that dealing with work and fatigue, has been mentioned. This must suffice for the present. All who are concerned with the whole subject will be well advised to study the other sections which deal fully with lighting and vision, heating and ventilation, accidents and sickness absence and labour wastage. For our present practical purposes the matter has been well summarized by *The Lancet* in the following words: "War conditions produce a cumulative state of chronic industrial fatigue, with its invariable accompaniments—industrial inefficiency and increased morbidity, as well as a higher accident-rate. It is so fatally easy to remember the need for greater immediate production and to forget the price that must be paid for it."

What of Australia and Australian conditions? Every Australian knows that a magnificent effort is being made by persons in every walk of life to give of their best in the common cause. What we need to do is to see that our zeal does not run away with our common sense, that unfair burdens are not placed on any one section of society, and that no obvious step in the betterment of conditions is left untaken. From inquiries made in reliable quarters it appears that workers in certain industries essential to the war effort are staying at their posts for as long as twelve hours in a shift and that adequate rest pauses are not always made in this period. Obviously this cannot be conducive to the health of the worker, nor to his happiness and contentment, which are intimately bound up with his health. The results of research in England have been restated, and none can doubt that they are applicable to Australia as well as to the Centre of Empire. It would be easy to suggest that a board consisting of representatives of government and of other organizations should be set up to investigate and supervise this thing. But such a step would result in more conferences and in much more talk of a kind with which most people are sated. As already declared, the present need is for the application of knowledge already gained and not for fresh research. In certain war-time industries medical officers have been appointed to supervise the health of the worker, and this is good as far as it goes. But it is on basic principles that stress must be laid. If work is so long that it is not producing the best results and is also a hardship on the worker (and we believe that both these conditions obtain), working hours must be reduced, and no one will believe that the machinery does not exist to effect this reduction. In some places the matter is not quite simple. For example, in Lithgow, New South Wales, there is an acute shortage of houses, and some workers have to be brought daily by motor 'bus from Katoomba, many miles distant. A worker catches his 'bus at 5.45 o'clock in the morning. He begins work at 7 a.m. and works without a rest pause till 12·30 p.m.; he has until 1·30 p.m. for his luncheon and then works till 5 p.m., when he has a pause of ten minutes. He leaves off work at 7 p.m. and is taken by motor 'bus to his home, which he reaches at about 8.15 p.m. He does this on five days a week. On Saturday he leaves Katoomba at 6.45 a.m. and returns at 1.30 p.m. The times for men working on night shift are comparable with those of the day shift. Again, some men have to live in Lithgow and keep their families elsewhere. In these circumstances it is easy to see that payments for overtime are welcome to workers. If the provision of accommodation for, say, a thousand additional families in Lithgow would settle the matter, it should not be beyond the wit of the governments concerned to provide the dwellings without delay. But the situation at Lithgow is only one example; the whole problem of fatigue and industrial output remains. Tinkering will not solve it; the problem is real and it can be solved.

Current Comment.

PREGNANCY ACCIDENTS IN DIABETES.

The story of diabetes is not so simple as we have been prone to think. The conception of a pancreas failing to produce enough insulin for the body's needs and the consequent disturbance of metabolism is as simple as one could wish, but it is not always satisfying. The further our knowledge of endocrinology goes, the more elaborate

we realize the interplay of the ductless glands to be. The pancreas is no exception. The most emphatic demonstration of this fact was provided by the revelation that the pituitary plays an important part in producing diabetic coma in a dog from which the pancreas has been removed. If the pituitary too is removed, diabetic coma does not develop. Such realizations as this led the way for work like that recently published by Priscilla White and Hazel Hunt,[1] who discuss the prediction and prevention of pregnancy accidents in diabetic women. It first became plain that adequate dietary control and insulin therapy did not lower the fœtal mortality rate. It was then found that in some cases there developed a disturbance of the balance of pregnancy hormones—gonadotropin, œstrogen and progesterone, and the patients with this imbalance were those in whom pregnancy accidents and stillbirths were likely to occur. White and Hunt, from a survey of 61 completed diabetic pregnancies, reached the conclusions that: (*a*) an abnormal rise of chorionic gonadotropin after the twentieth week of pregnancy predicts in the diabetic premature delivery, stillbirth and neonatal deaths; (*b*) these accidents are caused by a failure of production or metabolism of progesterone and œstrogen; and (*c*) they can be prevented by continuous substitution therapy with these hormones in replacement doses.

Of the 61 patients there were 25 whose hormonal balance remained normal. The course and outcome of these pregnancies were uneventful. There were no instances of preeclamptic toxæmia or premature delivery, and the fœtal survival rate was 92%, one death being due to *asphyxia pallida* and one to hæmorrhagic disease of the newborn. Twelve of the 61 patients developed hormonal imbalance which was uncorrected by replacement therapy. Nine of these suffered from preeclamptic toxæmia, and the remaining three had premature deliveries. The fœtal survival rate was only 42%. With the rise of chorionic gonadotropin the mothers had either a rapid severe toxæmia with expulsion of a macerated fœtus, or without toxæmia were delivered of a premature but mature-looking atelectatic infant, which often died. The remaining 24 women developed hormonal imbalance, but it was controlled by the administration of œstrogen and progesterone or of stilbœstrol and pregnolinine. The latter two preparations are much cheaper and easier to obtain than the two former and proved equally effective. The results in this treated group were that toxæmias were controlled, no premature deliveries occurred, and the fœtal survival rate was about 90%. The management of the cases was as follows. The diabetes was controlled by an adequate diet and insulin. If hormonal assays showed a fall of œstrogen and progesterone or a rise of chorionic gonadotropin, the patient was given by mouth stilbœstrol in doses of 40 to 120 milligrammes daily and pregnolinine 10 to 40 milligrammes daily, therapy that cost relatively little but was apparently highly effective. If the œstrogen level was still low after two weeks' adequate trial with stilbœstrol given by mouth, the drug was given by intramuscular injection in doses up to 50 milligrammes a day.

The care of infants born of diabetic mothers who had not been given this hormonal investigation and therapy is discussed in the same journal by W. R. Sisson. He points out that among diabetic mothers miscarriages and stillbirths are common. The babies, even though often born prematurely, are large, the increase being of soft tissues and not of skeleton. Many of them show increase in size of the islets of Langerhans. The idea, however, that they often have symptoms caused by hypoglycæmia, Sisson regards as erroneous. In a series of 65 infants he found that in most cases the blood sugar was high. Hypoglycæmia was a rare complication, but was sometimes seen if the mother had been given insulin shortly before delivery. The symptoms seen varied considerably. Irregular and rapid respirations were common. Cyanosis, jerky movements of the extremities and general sluggishness were frequently seen. In the worst cases there was evidence of cerebral anoxia, cyanosis and asphyxia, frequently terminating in death. The routine treatment adopted was immediate and repeated drainage of the respiratory tract, a considerable amount of clear yellow fluid resembling the contents of the amniotic sac being obtained. The child was then placed in an atmosphere of 40% to 50% oxygen with controlled heat and humidity, and left there for at least twenty-four hours. If the infant's condition was satisfactory, small feedings of dextrose were commenced on the second day. Attempts to have the infants breast fed were usually unsuccessful. No forceful physical stimulation was given to make the babies breathe. The majority of the infants were delivered by Cæsarean section a little before term. The mortality rate among this group of infants was only 18%, a figure that must be regarded as highly satisfactory. These two papers are welcome, for they give hope of considerable improvement in the handling of a difficult problem, and one that is becoming more and more often encountered, for insulin therapy has made it possible for many child diabetics to live to adult life, to marry and to conceive.

[1] *The Journal of the American Medical Association*, December 14, 1940.

COLLOIDAL ALUMINIUM HYDROXIDE IN THE TREATMENT OF PEPTIC ULCER.

IN February of last year reference was made in these columns to a review by Woldman and Polan of 407 consecutive cases of peptic ulcer in which colloidal aluminium hydroxide had been used. On that occasion it was pointed out that most clinicians who use this medicament attribute the consequent good results to the antacid action of the substance. It was also explained that there are two ways in which the drug is used. One is the constant drip method, in which the diluted colloidal substance is instilled into the stomach continuously by an indwelling naso-gastric tube; in the other method the drug is given by mouth at frequent intervals. E. N. Collins, C. P. Pritchett and H. R. Rossmiller have recently reported a follow-up study of 246 cases of peptic ulcer in which aluminium hydroxide was used.[1] Satisfactory results were obtained in 88% of these cases. In the space available it is not possible to give details of the cases; nor is it necessary. The authors are convinced of the value of the drug, but insist that the recorded results cannot be attributed to the use of aluminium hydroxide alone—a point emphasized in our previous discussion. They state that the hygienic needs of the patient were considered first and that many additional factors, such as the avoidance of undue fatigue, stresses and strains, and the taking of at least one feeding between meals, received equal emphasis. They also refer to the experimental work of several investigators and express the opinion that the beneficial effect of aluminium hydroxide may be due to several factors and not to its antacid properties alone. The discussion on the paper was interesting. James Flexner said that possibly the gastric acidity was a protective factor and that "it should not be completely carried out of the acid range". He thought that Collins and his associates had clearly shown that the buffering effect of aluminium hydroxide was adequate to keep the patient comfortable and allow healing of the ulcer. I. H. Einsel said that the failures in treatment were more important than the successes. Failures should be critically examined; it was necessary to be sure that the case was a medical one—that the condition was not one that really called for surgical treatment. Isidor Greenwald urged caution in the use of aluminium hydroxide over a period of years, owing to the possibility that it might remove vitamins from the diet or make them unavailable. Collins replied that the question of vitamins had received careful attention. He and his associates were using with aluminium hydroxide a much more liberal diet than they had used before its advent; moreover, the gain in weight per patient for a unit of time was greater than with any other antacid.

[1] *The Journal of the American Medical Association*, January 11, 1941.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Actinomyces from Normal Mouths and from Lesions.

H. R. SULLIVAN AND N. E. GOLDSWORTHY (*The Journal of Pathology and Bacteriology*, September, 1940) have made a comparative study of anaerobic strains of actinomyces from clinically normal mouths and from actinomycotic lesions. As the normal habitat of *Actinomyces bovis* does not appear to be definitely established, and the authors were struck by the constant mention of trauma in the histories of patients with actinomycotic lesions in the cervico-facial region, they thought that this might suggest that the organisms were already in the mouth and that after injury had produced suitable conditions they set up the disease process. A series of 125 cultures were made from patients who had had dental extractions on account of dental caries, pyogenic infections, or lesions other than actinomycosis, and after anaerobic incubation six strains of *Actinomyces bovis* were recovered. Five strains were recovered also from lesions clinically described as actinomycosis. The two groups of organisms appeared to be identical in all cultural and biochemical examinations made. Attempts to estimate possible animal pathogenicity failed, either by direct injection of the culture or by the implantation of splinters of wood which had been soaked in the cultures. Small red lumps occasionally developed at the site of injection, but no form of progressive disease appeared in any of the animals. The authors believe that the results of their investigation lent support to the view that the mouth is a frequent habitat of *Actinomyces bovis*, and that when suitable conditions arise, as after the trauma of dental extractions or other forms of trauma, the clinical condition of actinomycosis can be produced by the organisms.

Composition of Diphtheria Toxin.

R. A. Q. O'MEARA (*The Journal of Pathology and Bacteriology*, November, 1940) has investigated *Corynebacterium diphtheriæ* and the composition of its toxin in relation to the severity of the diphtheria. He viewed the problem from two angles, namely, that one type of clinical picture usually, though not always, associated with *gravis* infection, is dominated by toxic symptoms, and antitoxins prepared by modern methods are not highly efficacious in such cases, yet no difference in the toxins prepared from the infecting strains as compared with the standard strains can be detected in laboratory experiments. The author tried to discover whether any new action of diphtheria toxin could be found. Saline extracts from forty-eight hour Löffler slope cultures of *Corynebacterium diphtheriæ* were made and filtered, and small amounts were injected subcutaneously and intracutaneously into guinea-pigs. In the first instance the reaction obtained was the usual one, with little local change, and when larger doses were used, the classical signs were obtained with pleural effusion, suprarenal congestion and death. With the intracutaneous method, however, marked local wheal formation occurred, followed by erythema and swelling, and in a certain number of pigs the reaction appeared very rapidly and was followed by central necrosis. Inclusion of living organisms in the inoculum made no difference to the lesion, and many surviving animals developed paralysis. The author concluded that the experimental results justified the inference that there were two fractions of diphtheria toxin, which he called A and B. The more commonly produced fraction A was responsible for the simple picture of diphtheria, and the fraction B present in larger amount in his saline extracts was associated with the severe infection. He suggests that fraction A is the predominating fraction in toxins used for the production of commercial antitoxin, and that therefore such antitoxin is effective in the ordinary case and fails in the hypertoxic or malignant case; he bases this view on the assumption that the two fractions are antigenically distinct and can give rise to specific antitoxins. Experiments with mixtures of saline extract and ordinary toxin, added to antitoxin and then injected into guinea-pigs, which gave rise to the œdematous type of lesion and provided further evidence in support of this theory, suggested that A substance had been effectively neutralized and B substance was still free to exert its characteristic action. In the sphere of immunity this theory also affords an attractive explanation for the occasional record of severe diphtheria in immunized children when a strain of organism producing large amounts of B substance infects a child who apparently has sufficient anti-A substance to produce failure of reaction to a skin test with commercial toxin. It remains for further experimental work to show whether an antitoxin specific for B substance can be prepared, and to test it clinically in the hypertoxic or malignant case.

Excretion of Hæmoglobin and the Transfusion Kidney.

S. D. NAVASQUEZ (*The Journal of Pathology and Bacteriology*, November, 1940) has investigated the excretion of hæmoglobin, with special reference to the transfusion kidney. The fact that oliguria and increased blood urea are common findings in a number of other conditions, and the lack of explanation for the occurrence of jaundice in cases of transfusion reaction indicated the need for investigation of the subject. Three patients who died after transfusion (two having received incompatible blood) and one patient with paroxysmal hæmoglobinuria were available for study. A histological study of human kidneys showed only a small proportion of glomeruli of pathological appearance, there was little excess of iron concentrated in the lumina of the tubules, and the capsular spaces did not appear to be unduly dilated, actual measurements not being widely different in all three cases. In the one patient whose blood pressure was recorded after the transfusion, the systolic pressure was found to be 70 and the diastolic pressure 40 millimetres of mercury. Two patients had been treated with alkalis and were passing strongly alkaline urine, although in very small amounts. To test the theory of acid blockage of tubules by iron débris as a cause of the anuria the patient with paroxysmal hæmoglobinuria was given ammonium chloride by mouth, and then his feet and one hand were chilled in ice. Hæmoglobinuria developed and lasted for six hours, the blood hæmoglobin percentage fell from 82 to 75, the blood urea content rose from 27 to 31 milligrammes per 100 cubic centimetres, and it was calculated that approximately 10% of the patient's blood was lysed. The hourly volumes of urine diminished slightly and remained strongly acid, but no disturbance of renal function could be detected. Further experiments were performed on rabbits, one series being fed to produce an acid urine, the other an alkaline one, and they were then injected with large amounts of rabbit hæmoglobin. The blood urea content increased slightly, but the kidney function tests gave normal results and histological examination of kidneys from rabbits sacrificed at varying intervals after the injection showed that those secreting acid urine retained less iron pigment and retained it for a shorter time than those secreting an alkaline urine. The author believes that the changes in the so-called transfusion kidney do not support the view that mechanical blockage of the tubular lumina by altered blood pigments can be responsible for the anuria seen in fatal cases of blood transfusion.

Influenza Virus in Embryo Chick Lung.

F. M. BURNET (*The British Journal of Experimental Pathology*, June, 1940) describes in detail Buddingh and Polk's technique of inoculating the amniotic cavity of the developing egg with influenza virus and the resulting lesions in the embryonic lung. This is an elaboration of the method in common use, that of the chorio-allantoic membrane, and is an improvement in technique in that it places virus in the amniotic fluid, where it may infect the embryo by the natural channels. The author describes the development of the chick lung and its normal histological appearance at twelve days, and illustrates the lesions found in infected embryos. He also mentions changes found in the tracheal fluid, and the presence therein of small granular bodies which are apparently colonies of the virus. Only those viruses which are "pneumotropic" will take by this method of inoculation, with the single exception of the virus of psittacosis. Virus has been isolated directly from nasal washings by this method: Burnet considers that it is a useful one and may easily result in the isolation of viruses as yet unrecognized.

Reduction of Antibody in Blood.

ERNEST WITELSKY, NIELS KLENDSHOJ AND PAUL SWANSON (*The Journal of Infectious Diseases*, November-December, 1940) made experiments to attempt the reduction or elimination of the anti-A antibody in O blood by means of the addition of the A specific substance. The investigation was made on account of the larger percentage of "reactions" after the use of universal donor or O blood for transfusion into patients of groups A and B than after the use of homologous blood. A substance was isolated from peptone and used in a 1 in 1,000 saline solution. Serum from group B, that is, containing anti-A agglutinin, was mixed with varying dilutions of the A substance and allowed to interact at room temperature for fifteen minutes, and a suspension of group A cells was added. At a dilution of 1 in 250 of

the A substance agglutination was completely inhibited, thus proving that all the A agglutinin had been absorbed. A quantitative experiment was made to determine the appropriate amounts of substance to be used with large amounts of blood; also tests for possible toxicity were carried out; but as rabbits could tolerate large intravenous doses, the substance was considered harmless. Ten transfusions were given to human patients of group A, treated O blood was used, and no reactions were observed that could be attributed to anti-A in the patients' plasma; the authors believe that the addition of A substance was both harmless and effective.

Agglutination Test for Typhus.

N. PAUL HUDSON (*The Journal of Infectious Diseases*, November-December, 1940) have elaborated a macroscopic agglutination test with typhus Rickettsiæ prepared from infected rodent lungs. The Castanedas method of differential centrifugation was followed, and the material was not diluted or treated with formalin. The technique was similar to that used for ordinary bacterial agglutination, serial dilutions of unknown serum being mixed with an equal volume of Rickettsiæ suspension and incubated in a water bath at 40° C. for three hours; the results were read immediately and after twelve hours in the refrigerator. Serum from normal animals failed to react; serum from immunized animals reacted in dilutions up to 1 in 1,280. Human serum from one series of controls gave very low reacting titres, another series did not react, serum from vaccinated persons over periods up to three and half years gave titres up to 1 in 160, while serum from six typhus patients and convalescents gave titres varying up to 1 in 2,560. The author intended his work to be preliminary to a survey of the extent and limitation of the test for clinical use as well as to the solution of certain experimental problems in connexion with typhus.

HYGIENE.

Prophylaxis of Dental Caries.

B. F. MILLER *et alii* (according to *Archives of Physical Therapy*, September, 1940) claim that the germicidal substance, alkyl dimethyl benzyl ammonium chloride, known as "Zephiran", when swabbed on the teeth is a good cleansing agent and at once inhibits the formation of lactic acid; they suggest its use for the prevention of dental caries. Other investigators (according to *Time*, December 30, 1940) make similar claims for carbamide and suggest the use of this substance for the prevention of dental caries.

Type II Pneumococcus Pneumonia in an Institution for Children.

C. C. DAUER, H. F. DOWLING AND J. E. NOBLE (*The American Journal of Hygiene*, January, 1941) record an outbreak of Type II pneumococcus pneumonia in an institution for children. This industrial home school provides for about 120 children, who stay about a year. The monthly turnover is twelve to fifteen. The children are in three groups: (A) fifty boys, 14 to 18 years of age; (B) 30 boys, 8 to 14 years of age; and (C) 40 girls, 12 to 21 years of age. The cots for the boys were only two to three feet apart. An epidemic of the relatively infrequent Type II pneumonia developed, 12% of group A being attacked, while 50% at some time became carriers. The carriers chiefly occurred in the cots close at hand. In groups B and C 10% were carriers and 20% of the staff, but no child developed pneumonia, though many had upper respiratory infections. Some carriers retained the organism for ten weeks, but no carrier showed the disease. At the beginning of the epidemic immunizing injections of Types I, II and III pneumococcus polysaccharide were given to 100 children, and 67 of these two weeks later gave intradermal "immune" reactions. Only one developed pneumonia, and that within six days of the antigenic injection, and three months afterwards the same lad failed to give an immune reaction. It is not clear how far the group injected were protected by the injection or had been non-susceptible.

The Protective Use of Measles Convalescent Serum.

FRANKLIN H. TOP AND GEORGE F. BADGER (*The American Journal of Hygiene*, January, 1941) discuss the protective use of measles convalescent serum in an epidemic that occurred in Detroit in 1935. In this epidemic only children under ten years of age who had not had measles were studied. They were from families in which the interval between the appearance of rash in the first case and that of the second was more than six days. The injections were of 10 cubic centimetres of pooled convalescent serum from adults who had had measles less than one year before. Random controls were taken from families in which the susceptibles exposed to infection had not been injected. Of these susceptible contacts under one year of age, 47% contracted measles. Of the 252 under one year who received serum, 64 developed the disease instead of a probable 119—a 46% reduction. From one to four years of age with injection before the sixth day a reduction of the attack rate of 31% resulted, and from the seventh to the tenth day a reduction of 22%. It is suggested, following the English practice, to employ in the older groups attenuation rather than protection. Under four years, when mortality is common, protection is the aim. The dose used in London is arrived at by doubling the age in years, with a minimum of five cubic centimetres.

Hæmoglobin and Reticulocyte Studies on Hookworm and Malaria Infected Children.

H. W. BROWN AND G. F. OTTO (*The American Journal of Hygiene*, January, 1941) report reticulocyte and hæmoglobin studies of children infected with hookworm and malaria. The Lane method of detecting light hookworm infections proved more effective than the Stoll method. The results of the Commission for the Eradication of Hookworm were studied, and children were compared in malarious and non-malarious areas. While a reduction in hookworm infestation has occurred in general, there persist localized rural communities and isolated indigenous families with heavy infections. Of the specimens of blood, only 9·42% in the known malarious area gave positive results. No difference was noted in hæmoglobin level between the worm-free and worm-infested, nor, on the other hand, did the worm-infested in the malarious area show any marked change. The hæmoglobin values all round are low as compared with reports from northern States, but would be normal for tropical areas. Many may be on the threshold of anæmia, to which these infections may contribute. The reticulocyte percentages were similar whether the children were worm-infested or worm-free; in malarial cases they were somewhat higher, though not outside the normal range. It is probable that reticulocyte response and hæmoglobin level are inversely related.

The Complement Fixation Test in Epidemic Influenza.

M. D. EATON AND E. R. RICKARD (*The American Journal of Hygiene*, January, 1941) have studied the complement fixation test in epidemic influenza. In Westchester County, New York, 1,000 persons, four to eighty-five years of age, were tested during the spring months of 1938-1939, and also "acute and convalescent" serum was taken from patients. Patients who numbered 275, diagnosed on clinical signs as suffering from epidemic influenza, gave a definite increase, reaching in ten to fourteen days a maximum in complement-fixing antibodies measured by influenzal antigen from mouse lung. This was not found in other respiratory disease or in normal persons not exposed to epidemic influenza. A titre of 1 to 16 and over occurred in 80% to 90% of cases, while only 5% of normals had a titre of 1 to 16. The authors claim the method as economical in time and effort in the surveying of large groups.

The True Growth of the Negro Population.

ROBERT J. MYERS (*The American Journal of Hygiene*, January, 1941) writes a further note on the true growth of the Negro population. With an estimate that only 81% of Negro births are registered the net reproduction rate of Negroes since 1930 somewhat exceeds that of the white. In 1930 the two were about the same. Both had rapidly decreased in the previous ten years; while the white rate kept on decreasing till 1933, the Negro rate has increased since 1930 by one-sixth. The Negro population is now 9·7% of the total, but estimates for the future suggest a quick increase to 11·5% with significant effects on the racial balance.

Remission and Mortality Rates in Schizophrenia.

B. A. LENGYEL (*The American Journal of Hygiene*, January, 1941) studied over 4,600 definite cases of *dementia præcox* during 1910-1938 at Worcester State Hospital, Massachusetts. The mean ages on first admission for men and women are 30·7 and 34·5 years respectively. Rather more males are admitted for the first time, but more females for each repetition. Remissions are highest in the first three months and after one year fall off rapidly. Under thirty the remission rate is higher. The mortality in the first year is five to six times the general death rate in the whole population, in later years only twice as high. Irish, 20%, and French, 10%, provided the most cases, but the proportion in the general population of each race is not stated.

British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the Tasmanian Branch of the British Medical Association was held at the Tasmanian Museum, Hobart, on February 22, 1941, DR. A. W. SHUGG, the President, in the chair.

Report of the Council.

The annual report of the Branch Council for the year 1940 was read and adopted. The report is as follows.

The membership of the Branch, which was 81 at the beginning of 1940, was 95 at the beginning of 1941. Six members have been transferred from other Branches; seven have been elected; and eleven have resumed membership by payment of the overdue subscription; while four have left the State; and six have lapsed through non-payment of the subscription for 1940.

Ten general meetings of the Branch have been held, the average attendance being 11·5.

Papers have been read by Dr. Shugg, Dr. Crowther, Dr. T. Giblin, Dr. Hamilton and Dr. McIntosh; and cases have been demonstrated by Dr. Whishaw, Dr. Wise, Dr. White, Dr. Blackwood and Dr. Duncan.

A post-graduate course arranged by the Southern Division was held in Hobart in May; and one arranged by the Northern Division in Launceston in November.

Five meetings of the Branch Council have been held, the attendances being as follow:

Dr. Shugg	5	Dr. Crowther	4
Dr. Craig	1	Dr. Gibson	3
Dr. T. Giblin	1	Dr. W. Freeman	1
Dr. G. M. Clemons	2	Dr. McDonald	1
Dr. Grove	3	Dr. Walch	5
Dr. Hiller	4		

The Branch has been represented on the Federal Council by Dr. Crowther and Dr. Gibson. At the end of the year Dr. Crowther made known his intention of withdrawing from this position; and when the period of his appointment terminated Dr. Craig was appointed by the Branch Council to succeed him. Dr. Crowther has earned the gratitude of the Branch for the adequate manner in which he has performed the onerous duties of his office since his appointment in December, 1935.

The Branch has suffered a great loss by the departure overseas of a number of active and valued members who are serving with the military forces. This loss is so severe, especially from the Hobart district, that there is likely to be difficulty in carrying on the regular meetings of the Branch every month.

Among the matters which have received consideration by the Branch Council during the year, the following may be mentioned.

Subscriptions of Members on Active Service.—Last April the Branch Council made a recommendation that the subscriptions of members on active service overseas should be three guineas. This proposal did not receive the approval of a special meeting of the Branch, which considered that the members concerned should be relieved of all financial responsibility to the Branch. The Branch Council has reconsidered the matter, but finds that it is not possible for the members to retain their membership unless a subscription is received from them, or on their behalf. The Council has therefore made a new recommendation that these subscriptions be reduced to two and a half guineas.

Scheme for Compensation of Loss of Practice.—At our last annual meeting it was mentioned that a scheme for this purpose had been approved by the Branch Council and was about to be circulated to members. This scheme did not meet with the approval of members. It did not receive sufficient support to enable it to be brought into operation. The Council has now introduced a very much simpler scheme, the response to which is being more favourable.

Financial Statement.

The Honorary Treasurer's financial statement for the year ended December 31, 1940, was received and adopted. The statement is published herewith.

Election of Office Bearers.

The following office bearers were declared elected for the ensuing twelve months:

President-Elect: Dr. W. E. L. H. Crowther.

Vice-President: Dr. B. Hiller.

Honorary Treasurer: Dr. W. Freeman.

Honorary Secretary: Dr. J. H. B. Walch.

Auditors: Messrs. Adams, Son and Bennetto.

Only one nomination had been received for membership of the Council and three were required. Dr. J. L. Grove was elected and two positions were declared vacant.

THE BRITISH MEDICAL ASSOCIATION (TASMANIAN BRANCH).

Statement of Receipts and Payments for the Year ended December 31, 1940.

RECEIPTS.

	£	s.	d.	£	s.	d.
To Balance as at January 1, 1940				324	2	7
„ Members' Fees—						
1939—34 at £4 4 0	142	16	0			
1939— 3 at 2 2 0	6	6	0			
1940— 9 at 2 2 0	18	18	0			
1940—84 at 4 4 0	352	16	0			
1940— 1 at 5 5 0	5	5	0			
1940— 1 at 7 7 0	7	7	0			
1940— 3 at 6 16 0	20	9	6			
1941— 1 at 2 2 0	2	2	0			
1941— 3 at 4 4 0	12	12	0			
Sundries	0	1	6			
				568	13	0
„ Interest on Fixed Deposit at Hobart Savings Bank				5	10	8
„ Interest Commonwealth Inscribed Stock				10	2	6
„ Fixed Deposit E.S. & A. Bank				100	0	0
„ Interest on Fixed Deposit				6	0	0
				£1,014	8	9

PAYMENTS.

	£	s.	d.
By Rent, Royal Society of Tasmania	10	0	0
„ J. H. B. Walch—Petty Cash	27	18	4
„ Victorian Branch	0	2	7
„ J. Walch and Sons	6	19	3
„ J. B. Walch—Honorarium £30 and Cash Account £28 13s. 7d.	58	13	7
„ Australasian Medical Publishing Company	61	0	0
„ British Medical Assurance (London)	117	6	0
„ Adams and Bennetto—Audit Fee	3	3	0
„ War Savings Certificates	106	8	0
„ Federal Council	20	5	0
„ Reynolds and Cummins	2	2	0
„ Murdoch, Cuthbert and Clarke	0	10	6
„ Critic Limited	1	14	0
„ Bank Charges	1	2	9
„ Transfer to Southern Division	9	12	0
„ Balance	587	11	9
	£1,014	8	9

Statement of Assets.

	£	s.	d.
Cash at Banks	587	11	9
Fixed Deposit, Hobart Savings Bank	150	0	0
Commonwealth Inscribed Stock	300	0	0
Australasian Medical Publishing Company, Limited—Debenture	95	0	0
Furniture at Library	20	0	0
War Savings Certificates	106	8	0
	£1,258	19	0

Audited and found correct.

pp. ADAMS & BENNETTO.

(Signed) A. W. WOOLLEY,
Chartered Accountant (Aust.).

February 21, 1941.

Medical Practice Compensation Fund.

The meeting considered a new scheme for the compensation for loss of practice by members on active service overseas. The scheme is set out in the following letter that had been sent to all members.

> This is an appeal to all medical practitioners in Tasmania from a committee appointed by the Tasmanian Branch of the British Medical Association.
>
> It is proposed that the medical practitioners remaining in Tasmania should contribute to a fund to assist medical practitioners who have left Tasmania on active service overseas, and have thereby suffered grave financial loss.
>
> A previous scheme circulated among members of the Branch for the same purpose was not favourably received but a subsequent general meeting of the Branch reaffirmed the desirability of some such scheme, and it is hoped the following simplified proposals will meet with general approval.
>
> It is now suggested that every practitioner should agree to make regular payments to the fund, and it is hoped and expected that the amount will not be less than ten shillings per week (payable monthly).
>
> It is proposed that Trustees shall be appointed by those who signify (before February 15th, 1941) their willingness to contribute, and that such Trustees shall control the administration of the fund, and be given full power to decide what amount shall be paid to any medical practitioner, and to vary the amounts at their discretion.
>
> The committee urges members to give their earnest and immediate attention to the matter, and to notify the Secretary of the amount they are willing to contribute, so that the fund may be started as soon as possible.

It was resolved that the scheme described in the circular letter should be adopted by the Branch and that the new Council should be instructed to bring it into effect.

Induction of President.

Dr. A. W. Shugg then introduced Dr. C. Craig, the President for the ensuing year. Dr. Craig thanked the members for his election and expressed to Dr. Shugg the gratitude of the Branch for the useful work that he had done during his year of office.

President's Address.

Dr. Shugg read his address on the subject of slum clearance.

Vote of Thanks.

At the instance of Dr. A. Pryde the meeting carried a vote of thanks to the members of the Branch Council.

Hospitals.

REPORT OF PARLIAMENTARY COMMITTEE ON HOSPITALS OF NEW SOUTH WALES.

In May, 1939, the Parliament of New South Wales appointed a joint committee of both houses to inquire into and report upon: (*a*) the appointment of honorary doctors and graduands to hospitals; (*b*) the treatment of and charges to patients in private, intermediate and public hospitals; (*c*) all matters incidental thereto and connected therewith. The committee took evidence from fifty-eight persons and issued a progress report which was ordered to be printed in April, 1940. In November, 1940, the progress report was referred to a committee consisting of six members of the Legislative Assembly and six members of the Legislative Council. The six members from the Legislative Assembly were: Mr. Norman Thomas (Chairman), Mr. J. G. D. Arkins, the Honourable H. P. FitzSimons, Mr. A. E. Budd, Mr. John Reid, Mr. E. L. Sanders. The six members from the Legislative Council were: The Honourable J. F. Coates, the Honourable Sir Norman Kater, the Honourable J. H. Tonkin, the Honourable M. P. Dunlop, the Honourable H. Latimer, the Honourable F. E. Wall. The final report has been issued by this committee and has been printed. Below we publish the full text of the report.

INTRODUCTION.

THE JOINT COMMITTEE of the Legislative Council and Legislative Assembly (a Resolution for the appointment of which was originally agreed to by the Legislative Assembly on 30th May, 1939, and concurred in by the Legislative Council on 1st June, 1939) which was appointed "to inquire into and report upon

(a) the appointment of honorary doctors and graduands to hospitals; and

(b) the treatment of and charges to patients in private, intermediate and public hospitals; and

(c) all matters incidental thereto and connected therewith,"

with leave to sit during the sittings or any adjournment of either or both Houses, and to which was granted on 6th June, 1939, leave to make visits of inspection within New South Wales and to other States of the Commonwealth—a Resolution for the re-appointment of which Committee under similar terms of reference was agreed to by the Legislative Assembly on 20th November, 1940, and concurred in by the Legislative Council on 26th November, 1940, and to which was referred the Progress Report from, Minutes of Proceedings of, and Evidence (together with Appendices) taken before the Joint Committee of Session 1938-39-40, has agreed to the following Report which it now presents to your Honourable Houses upon the subject matter of its Inquiry, including certain further comments on the problem of Hospital Finance, in amplification of its Progress Report upon that subject, which was presented to the Legislative Assembly on 2nd April, and to the Legislative Council on 9th April, 1940:

1. Your Committee has the honour to report that since the submission of its Progress Report (referred to above) it has concluded the taking of evidence.

2. For convenience, the several principal subjects of your Committee's Inquiry are dealt with under separate sectional headings, and wherever a recommendation is made it will be found at the end of the Section of your Committee's Report to which it refers.

SECTION 1.

Public Hospitals.

1. It is to be regretted that so few of the public realise the very real need and very great value of our large modern public hospitals. They still regard them merely as homes for the sick-poor, which admittedly was their original purpose. What they do not realise, however, is that during the present century these hospitals—particularly teaching hospitals—have become our chief source of medical knowledge, and as such have given a tremendous contribution to the progress of medicine, and consequently to the well-being of all.

2. Apart from the University little clinical research takes place elsewhere than in these hospitals; principally because they provide the only laboratories and material in which the effects of disease can be observed on a scale sufficiently large to provide investigation into practically all its avenues. Their large outpatients' departments also provide one of the few means of studying the effects of preventative medicine which though the most important, is the least remunerative to the private practitioner.

A public hospital must therefore be looked upon as much more than merely a collection of sick persons. Actually it is indispensable to medical progress and the knowledge gained within its walls is as beneficial to the general public outside as to the individual patient there. Rich and poor alike reap the benefit, for it provides the whole community with a trained medical profession.

3. The wealthy citizen, who has undergone a most delicate and successful operation, which has probably given him another twenty years or so of healthy life, may feel he owes a great obligation to the specialist who performed the operation. He does! What he is apt to forget, however, is that he is under just as great an obligation to the public hospital, for it was there that the specialist very largely acquired his skill, first as an undergraduate, then as a graduate, later as a general practitioner and finally as a specialist. Actually, these hospitals, with their laboratories; their therapeutic, surgical and diagnostic facilities are the training ground of the whole medical profession, the foundations of modern medical practice and the source of most of the advancement and progress in medical science.

4. One example of the contribution being given to medical science and to the public may be gleaned by carefully prepared figures submitted by Dr. A. B. Lilley, Superintendent of Royal Prince Alfred Hospital, showing the mortality in the treatment of appendicitis—the most common surgical emergency—in that hospital.

Period.	Appendicitis, Acute and Chronic. Death Rate per cent.	Appendicitis with Abscess. Death Rate per cent.	Appendix Ruptured, with General Peritonitis. Death Rate per cent.
1920-25	0·55	13·18	48·88
1926-34	0·43	2·07	40·18
1934-39	0·25	1·9	28·9

The mortality rate of all cases over the period 1920-1939 has been more than halved. This improvement your Committee believes is of benefit not only to those patients treated in that particular hospital, but is, by the experience gained there by students, graduates and practitioners, disseminated throughout the length and breadth of the State to the ultimate advantage of the public generally, irrespective of rank or station.

The average expectation of life has increased enormously in the past 100 years, and beyond doubt these Public Hospitals have played an important part in that progress.

It has been stated in evidence that these hospitals *attract* "our best medical men," but rather is your Committee of the opinion that they *create* our best medical men.

5. It is therefore the hope of your Committee that this report will awaken the general public and the Parliamentarian to the great obligation we all owe to these hospitals. It also hopes that it will lead them to recognise that although one's circumstances in life may be such that it will never be found necessary to enter one of these institutions, such institutions are nevertheless the foundation of practically all the medical service received outside the hospital, whether it be from the general practitioner or the specialist, and are therefore worthy of the utmost support that can be extended to them.

The value of the training these hospitals can, and should, provide for the medical profession as a whole, together with the service they render either directly or indirectly to each and every citizen has been constantly kept in mind by your Committee in all its recommendations.

SECTION 2.

University Entrance Examination and Medical Curriculum.

1. It was because your Committee felt that the future of the Medical Profession depended so largely upon the careful and thorough training of the medical students that it took such extensive evidence regarding the medical curriculum.

The shortest period in which a student may complete the course in New South Wales is six years, with an additional compulsory year spent by the graduand in hospital practice and training before he is allowed to register as a doctor. Therefore, your Committee feels that there will be little opposition to the statement that the course is a long and exhausting one, imposing ever-increasing demands upon the students' time, energy and finances—despite the fact that a small salary is paid to the graduand in the Seventh Year. Nevertheless, your Committee observed from the evidence adduced that there is still a tendency to add more to the Medical Curriculum. This was clearly indicated by the expressed desire of some witnesses, not only for longer tuition in some of the subjects now taught, but even for the periodical introduction of additional subjects.

2. It has been suggested in evidence that there should be a longer period allocated to the teaching of children's diseases, infectious diseases, radiology, fractures and obstetrics, particularly in practical work, but unless steps are taken to reduce some portions of the present course, in order to make it possible for the student to cope with these additional demands, it would appear inevitable that within the next decade the Medical Course will become so long and, consequently, so expensive that it will be available only to a fortunate few.

3. It has been suggested, however, that it is quite possible to eliminate, successfully, at least portions of a number of the subjects now taught in the University, and this contention is supported by evidence given both in New South Wales and Queensland, not merely by students, but by eminent medical men.

For instance, considerable evidence was given that very little of the Botany taught was of any real value to the medical student; that the course in Zoology was unnecessarily long; and that there were far too many lectures throughout the course. Suggestions were common that both Botany and Zoology should be combined as one subject: Biology, and all matter in this subject not relevant to Medicine, be omitted. This would mean that three subjects would be prescribed for the First Year, viz., Physics, Chemistry and Biology, only as they definitely relate to Surgery and Medicine.

4. Evidence disclosed that the tendency, both in America and on the Continent, is to teach these subjects in the Schools and Colleges and consequently to omit them from the subsequent Medical Course. Your Committee believes this to be the better method, but appreciates that, at the present time, it would be impossible to have all three subjects included in the curriculum of the schools of this State. Biology is included in few of them, and then only to a Junior standard, but Physics and Chemistry are taken in nearly all Secondary Schools, and your Committee believes that the teaching of these subjects could be extended, without great difficulty or cost to those few Secondary Schools where they are not at present being taught.

5. Your Committee is of opinion that school training in these subjects, starting at the age of 13 or 14 and extending over four years, is of much greater value in cultivating a scientific outlook than a year of crammed work at the University. This is of importance, as medicine is becoming increasingly inter-related with the work of the pure scientist and one can say quite definitely that the need of a thorough grounding in the basic sciences has become more and more necessary.

Furthermore, your Committee is convinced that the subjects of Physics and Chemistry to a required standard should be taken as University Matriculation Examination subjects, and that the ultimate aim should be to later include Biology also in the School Course. The omission of portion of Chemistry and Physics from the Medical Course should mean the saving of four months. An additional month or more could be saved each year by reducing accordingly the long vacation at the end of each of the first three years. Furthermore, notwithstanding the very natural desire of each tutor to see that as much attention as is possible be given to his own particular subject (even though the student be the sufferer), your Committee considers that, by a judicious readjustment of the time allocated for and some pruning of the remaining subjects, not only could the course be shortened by these means by an aggregate period of at least six months, but also that sufficient time could be found for further practical instruction in children's diseases, fractures, radiology, or in such other subjects as may be considered desirable.

6. Your Committee, therefore, suggests that the whole Medical Course should be reviewed by the University authorities, at the earliest opportune time, and consolidated into a Five-and-a-half Year Course. To help to achieve this, much of the pure Science should be done at school. The period of residence spent in hospital should be much increased in the final Year and the subjects taken in the preceding years adjusted accordingly. Arrangements could probably be made later for the whole of the final six or twelve months to be spent in residence in hospital, and the necessary provision made for students' hospital accommodation. Such action should be of inestimable value, as much of the urgent work in a big hospital is carried out at night and consequently is not generally available to the student.

7. If your Committee's recommendations in relation to the foregoing suggestions are adopted, the Final Year Examination would need to be held at the conclusion of the first term.

8. As previously indicated, your Committee feels that, whilst a compromise is being made by omitting portions of Physics and Chemistry from the First Medical Year and placing those subjects in the University Matriculation Examination, the ultimate aim should be that practically all pure Science should be taken at school. Evidence given as to the extreme congestion in the Science Classes at the University supports that view.

If the above suggestion is adopted the Medical Course at the University could ultimately be reduced to a period of five years instead of six years as at present.

9. It is probable that such proposals may not be acceptable to some educationalists, who would perhaps consider that early specialisation at school, and the definite scientific bias resulting therefrom, would interfere with the development of the broad cultural outlook which is so desirable. Your Committee, however, is impressed with the recent suggestions of the Department of Education respecting the desirableness of students taking their Leaving Certificate Examination in their Fourth Year at school and sitting for a higher Leaving Certificate in their Fifth Year. Up to the Fourth Year the subjects would be mostly cultural, and during the Fifth Year the studies would include the Sciences. By these means there would be cultivated that necessary combination of both a cultural and scientific outlook; and for those reasons the proposals could with advantage be adopted. One of the subjects that your Committee believes should be compulsory at the Higher Leaving Certificate is English.

and should be approached with a view to clear and grammatical expression in English rather than to the meticulous verbal study of special works, also the history of the development of social conditions should be of some importance.

10. Judging by the large number of failures in the first year examination in Medicine, that year might be regarded as a weeding-out year. It would certainly be much fairer to both the parent and the student (particularly if they are in poor circumstances) if some of that weeding out were done before time was wasted and expense incurred at the University.

Your Committee therefore recommends that,—

1. Students should take the Leaving Certificate Examination in their Fourth Year, and the subjects of that examination should be mostly cultural.

2. Students should sit for a higher Leaving or University Certificate in the Fifth Year, and Medical Students should take four subjects, including Chemistry, Physics and English—the additional subjects being optional.

3. The Medical Course be so arranged that—

(a) Students during their First Year at the University shall take Physics, Chemistry and Biology, in their relation to Medicine, and complete this part of the work by the end of the second term.
(b) Commence anatomy and physiology in the last term.
(c) That the long vacation in each of the First, Second and Third Years shall be reduced by one month.

4. The University authorities should revise, at the earliest opportune time, the whole Medical Course, with a view to its consolidation into five and a half years.

5. Provision be made for additional time in the final year to be spent by the student in residence in hospital.

SECTION 3.

Undergraduates' Training (University and Hospital).

1. Considerable dissatisfaction with the instruction and teaching throughout the Medical Course was expressed by both students and medical practitioners. Chief among the complaints were:—

"Whilst many lectures are extremely good, quite a number are the reverse."

"Far too much time is given to lectures and theory and too little to practical work."

"Some of the teaching is rather haphazardly given, and some of the lectures missed by students because of the absence of a tutor are never made good."

"Whilst most honoraries are keenly interested in their students, there are exceptions."

"In some cases there are insufficient honoraries and tutors for the number of students and, as a result, the number of students grouped around a patient is so large as to be unfair to the patient, the students, and the doctor concerned."

"The students, when at the Teaching Hospital, seem to lose contact with the University, and consequently, are in some doubt as to who actually controls them, and feel there is something lacking in the general supervision of their Course."

"Sixth Year students at the Teaching Hospitals are given far too few minor operations and too little practical work generally."

And perhaps the commonest of all the complaints is that "Many of the instructing honoraries are anything but punctual with their classes, being often late, and on some days failing to attend altogether."

2. Your Committee feels that whilst some of these complaints may exaggerate the true position, a number of them are justified, and both at the University and the Teaching Hospitals there has been a lack of supervision and of that concentration upon the teaching of the student so necessary in such a long and exacting course as Medicine.

3. This unsatisfactory state of affairs may be partly the result of a lack of clearly defined control, as there is undoubtedly an indefiniteness in this regard from the time the student enters the hospital. True, there is a Board of Medical Studies which largely controls the Medical Course, and there is also at each Teaching Hospital a Student Supervisor whose duty it is to control and supervise the students' work and act as a liaison officer between the student body and the Board of Medical Studies. This Board, however, seems to have met but seldom, and whilst there is apparently much dissatisfaction among the students in regard to their supervision and tuition, practically no complaints ever appear to have been made to the Student Supervisor.

4. Altogether the position seems most uncertain and unsatisfactory, and your Committee feels that if satisfactory control and supervision of the Medical Course is to be obtained, there must be a clear and deliberate definition of the duties which appertain to the various bodies and individuals concerned with the teaching of students, particularly in relation to the Student Supervisor, or similar officer.

5. If Teaching Hospitals are to justify their existence as such, then the importance of the teaching of undergraduates must never be overlooked, and in the making of appointments which are within the control of the Boards of these Hospitals, this function should be given the consideration it merits. This does not mean that appointments to the Honorary Staff should be made especially in the students' interest, but it does mean that students should enter the hospital as a right, and with the knowledge that they will be given the consideration and help to which they are entitled, so long as they abide by the conditions governing their presence at the hospital. It also means that when appointments are being made to the Medical Staff of a Teaching Hospital reasonable consideration will be given to the teaching ability of the applicant, in addition to his practical knowledge and academic attainments.

6. Further, your Committee is of opinion that every effort should be made to give undergraduates practical training in methods of examination and treatment, and (in their Final Year) experience in minor surgery. This is essential, because under existing conditions a graduate, whilst entitled to the degree of Bachelor of Surgery, might never have performed even the simplest of minor operations.

7. In regard to the Boards of Teaching Hospitals whose duty it is to select honoraries for their respective staffs, your Committee is of opinion that the Conjoint Board comprising the Senate of the University of Sydney and the Board of the Royal Prince Alfred Hospital is unwieldy, and should be abolished.

8. Your Committee also considers that the University should have reasonable representation on the Boards of Teaching Hospitals and that a uniform method of selecting honoraries for such hospitals be adopted.

9. In relation to the method of selection of Honorary Medical Staff for—

(a) Royal Prince Alfred Hospital,
(b) Other Teaching Hospitals,

your Committee recommends that:—

(a) A Board be created, to be known as the Medical Staff Appointments Board, whose duty it shall be to select, from time to time, the whole of the Staff of Medical Officers required by the Royal Prince Alfred Hospital. The Medical Staff Appointments Board shall consist of twelve members, of whom seven shall be members of the Board of Directors of the Royal Prince Alfred Hospital, and five shall be representatives of the University of Sydney (of whom one shall be the Vice-Chancellor of the University, who shall be Chairman and having a casting vote in addition to a deliberative or ordinary vote.)
(b) Similar Boards shall be established to perform corresponding duties in respect of each of the other Teaching Hospitals, and shall consist of not more than seven members of the Board of each such Hospital and of five representatives of the University of Sydney (of whom one shall be the Vice-Chancellor of the University, who shall have a casting vote in addition to a deliberative or ordinary vote.)

10. In relation to Undergraduate Training (University and Hospital) your Committee recommends that:—

(a) The Board of Medical Studies alone be charged with the regulation of undergraduate studies in such hospitals.
(b) A fund be created for the use of each Teaching Hospital—such fund to be used solely for teaching purposes, and that all expenditure from the Fund be on the recommendation of the Board of Medical Studies.
(c) All fees payable by students to hospitals (apart from fees for board and lodging) shall be paid into each respective Teaching Hospital Fund.
(d) Each such Fund shall be subsidised by the Government as it or the Hospitals Commission may think fit.
(e) While the University should continue to be responsible for the appointment and payment of all clinical lecturers and lecturers on special subjects in the Teaching Hospitals, the Board of Medical Studies shall be responsible for—
  (i) the appointment (or nomination) of members of such hospital staffs and the payment of all tutors, student supervisors and subordinate officers.
  (ii) the provision within the hospital of equipment for teaching purposes, but not for the provision of buildings and furniture.

(f) A full-time Student Supervisor, with appropriate clerical assistance, shall be appointed to the Staff of each Teaching Hospital or clinical school under the Board of Medical Studies, and each Student Supervisor shall act as liaison officer between his hospital and such Board, and shall perform all necessary secretarial work in relation to his duties as the Board of Medical Studies may consider necessary, but his association with the Teaching Hospital shall be limited to the supervision and teaching of students—subject to the provisions contained in paragraph 3 of Section 11 of this Report.

(g) The University shall be given adequate representation on the Board of Directors of each Teaching Hospital.

(h) In order to secure the proper order and working of the educational scheme, and afford counsel to and ensure supervision of students, the Dean of the Faculty of Medicine should be enabled to give greater time to co-ordinating and supervising the whole of the services of the Faculty, both pre-clinical and clinical.

SECTION 4.

First Year Graduates.

1. One of the most unsatisfactory phases in the training of medical men in this State is the poor and exceedingly limited opportunities given Junior, and in a lesser degree, Senior Resident Officers in our large Public Hospitals. Your Committee is of opinion that the most important post-graduate work in Medicine is that given to a doctor in the early years of his hospital training, and yet, in this State, this very necessary work appears to be greatly neglected. Even the Post Graduate Committee seems to have completely ignored it.

2. Doctors should not have to learn their medical "A.B.C." (at their patients' expense) unassisted by their seniors, and yet it was admitted by almost every witness that little undergraduate or graduate operative surgical instruction is given. To gain that necessary practical experience most young graduates find it essential to proceed overseas, although such training could and should be given here; not with a view to making our graduates surgical specialists, but rather that they may be competent to deal with acute cases of surgical emergency.

3. Your Committee is of opinion that every effort should be made to give practical training to First Year Resident Medical Officers in the more common types of urgent (not deliberate) major surgery, so that those medical men wishing to enter private practice may be able to undertake such surgery with reasonable skill and ability.

Deliberate major surgery may be regarded as more of a specialty, and it is neither desirable nor possible to train First Year Resident Medical Officers in this type of work; such experience and training may only be acquired later over a period of years.

4. Your Committee is of the opinion that the opportunities given Junior Resident Medical Officers in Sydney compare very unfavourably with those given to Junior Medical Officers at the Brisbane General Hospital, and at other hospitals where a paid full-time permanent medical staff is employed. Brisbane Hospital, for example, gives a range of experience in surgery far beyond that available to the men who attend the various Sydney hospitals. This not only applies to operative surgery, but also to the reduction of fractures and similar work. Regarding the qualifications of Sydney graduates, a Brisbane medical authority expressed in evidence the opinion that "the average Resident who comes from Sydney cannot do a simple job—such as applying a plaster to a fracture—because he has not had sufficient experience." Another stated: "In Sydney theoretical teaching was of a high standard, but the practical side was inadequate . . . the graduate who has been in the Brisbane General Hospital for twelve months is a much better qualified man than a Sydney man of similar experience. The Sydney man is inexperienced. A lot of the work in Sydney is cornered by individuals."

5. This statement is supported by evidence given by Resident Medical Officers in our Sydney hospitals. A typical excerpt is: "I have never had any tuition in the reduction of fractures; I have had nothing to do with fractures since I have been a Resident Medical Officer, and would not be competent to deal with a simple fracture. At the hospital to which I am attached practically all the fractures are handled by one man. Only on rare occasions do young doctors get the opportunity of reducing fractures. A lot of us go straight into practice after one year, with very little actual experience."

6. In Gynæcology also the opportunities of the young Resident seem extremely limited, and though this type of work is often regarded as a specialty, it nevertheless constitutes a very large part of the average private practice, and, therefore, every practitioner must have at least a working acquaintance with the subject. Relative to the opportunities given students in gynæcology at Brisbane General Hospital, Dr. H. S. McLelland, M.B., Ch.M., F.R.A.C.S., Senior Gynæcologist of that hospital, said in evidence: "The difference between a resident officer when he comes to me for obstetrics and gynæcology and when he leaves me three months later is an absolutely vital one."

7. By way of comparison with the very limited opportunities given in this State, your Committee quotes the operative work of three Resident Medical Officers of Brisbane General Hospital, Queensland:

Dr. McD., with one year's service as Resident Medical Officer, has spent five weeks in casualty, six weeks "doing" anæsthetics, six weeks orthopædics, six weeks urology, and three months general surgery. He has performed the following operations:

14 appendicectomies.
4 hernias.
8 curettages of uterus.
1 supra-pubic cystotomy.

(In a further period of twelve months he could reasonably expect this list to be more than doubled.)

Dr. H., with one year's service as R.M.O., has spent fourteen weeks doing ear, nose, throat and eye work, nine weeks urology, two weeks in general surgery, six weeks giving anæsthetics, three months in general medicine and nine weeks on infectious diseases. He has performed the following operations:

40 dissections of tonsils.
12 curettages of uterus.
1 supra-pubic cystotomy.
1 appendicectomy.
1 herniotomy.

Dr. W., three years as R.M.O., has performed the following operations:

20 dissections of tonsils.
60 guillotine operations for tonsils.
20 myringotomies.
20 appendicectomies.
4 herniotomies.
4 radical cure of hydrocele.
1 repair of prolapse.
2 external shortenings of round ligaments.
50 curettages of uterus.

(During this period he has also had control of ambulant fractures for two months, with the Orthopædic Supervisor as a consultant.)

These were stated to be cases taken at random, and typical samples of the work given to resident medical officers in that hospital.

8. Your Committee is, therefore, of the opinion that, before going into general practice, every graduate should be compelled to do twelve months' work as Resident Officer in hospital, and during that period he should be given an irreducible minimum of operations and made competent to perform the common surgery of practice.

Such an important matter should not be left to chance and the favour of surgeons on the staff. Many young doctors will be compelled to enter into practice in "one-man" towns in the far-flung areas in this continent, and it is, therefore, only right to ask that they be taught their work under competent supervision and without risk to the patients, especially as any one of them may be faced with an acute emergency as soon as he commences practice and in a position of having no one to assist him or refer the case to.

Further, as this first year in residential office is to be compulsory under the law, it is the considered opinion of your Committee that the Government should accept the responsibility of providing the necessary hospital positions for these graduands.

9. Your Committee therefore recommends that:

1. A First Year Resident Medical Officer should have a minimum of seven operations of the simpler kind, such as appendicectomy, herniotomy, etc., under supervision of Seniors—the doctor performing the operation to accept responsibility but a Senior must be present, and completely supervise the operation.
2. Reasonable opportunities be given Resident Medical Officers to gain experience in obstetrics, gynæcology, children's diseases, fractures, clinical procedures, etc.
3. A University or Post Graduate Committee should take control of First Year Graduands and arrange for their appointments to various hospitals.
4. Senior Resident Medical Officers to be also given reasonable opportunities for experience, similar to those enumerated in recommendation No. 2 above, for Junior Medical Officers.

SECTION 5.

Medical Appointments in Public Hospitals (Non-Teaching).

1. The Honorary Medical system wherein selected members of the profession give their services in an honorary capacity to public hospitals is the system which has been almost invariably adopted in this State. Under this system the medical profession has given a tremendous amount of gratuitous service to the sick poor, probably more than will ever be fully recognised or acknowledged. Your Committee has therefore given earnest consideration to that system as well as to the part-time and full-time paid systems, regarding which much evidence was taken both in this State and in Brisbane.

All three systems have both their advantages and disadvantages. With one or two exceptions evidence in this State strongly favoured the honorary system, but in Brisbane the Director-General of Health for Queensland, Sir Raphael Cilento, K.B., M.D. (Q.10556 p. 408), referring to the position in Queensland, said the paid system was "far more conducive to efficiency than the former haphazard honorary arrangement."

Probably when all factors are considered the full-time paid system is the cheapest. Cost, however, is not the only matter to be determined, as other factors which must be taken into consideration are of supreme importance.

2. Dealing firstly with public hospitals other than teaching hospitals, your Committee is of opinion that in determining the best system to be adopted, the following principles must be taken into consideration:

1. That the standard of the medical profession generally throughout the State is of much greater importance than the standard of any individual doctor or doctors.
2. That (except in regard to certain specialties and having regard to all aspects of the problem) the method which gives the greatest opportunities for medical and surgical proficiency to the greatest number of men is the method that should be adopted.

If this is correct, then it must be admitted that the paid full-time system has serious limitations, the chief amongst them being that it must exclude from public hospitals a very large proportion of our medical practitioners whose general medical standard must thereby be lowered. It would also handicap, to a certain extent, the resident doctor, in that he would have little contact with the earliest beginning and final outcome of disease, and in many ways be largely lacking in the type of experience the private practitioner obtains, particularly as regards social conditions. Even the part-time paid system would, in a lesser degree, mean the exclusion of a considerable number of medical men from our public hospitals.

3. Your Committee, therefore, is of opinion that the honorary system should be retained, but at the same time would state very definitely that in future it should be regulated and adjusted so as to give a greater contribution towards assisting the medical profession generally in obtaining the highest standard possible.

4. There seems little doubt that it is easier to become an efficient medical practitioner or specialist by practical experience in our large public hospitals than by any other means. In fact, it is difficult to see how a medical practitioner can develop into a competent all-round man if he is to be excluded from these institutions. Yet there are many fine men anxious to give honorary service who, under our present system, can never hope to get that opportunity.

Even in some of the specialties—Radiology, for instance—one finds the honorary positions in our leading Public Hospitals held by a mere handful of radiologists, whilst others are excluded altogether. This is wrong, and the inequality of opportunity is undoubtedly causing considerable discontent within the profession.

5. In a State such as New South Wales, where there are few big cities and many distant towns, the general practitioner giving service to the individual and to the family, must still play the principal part in our medical service. He should be capable of treating at least 85 per cent. of all illnesses, the balance being specialised work, where special training and knowledge are required. Your Committee, therefore, considers that as far as is practicable, the general practitioner must be given access to our public hospitals, and that steps should be taken accordingly. To do this there must be a limit to the number of hospitals one man can serve, and there must be a maximum retiring age (in Queensland public hospitals it is 55 years), and some limit to the number of beds one man may have allotted to him.

6. With respect to medical appointments and Honoraries, your Committee therefore recommends that—

(1) The standard of the Medical Profession generally should be raised by ensuring that a greater number of its members have access to the advantages offered by public hospital experience.
(2) Except in certain specialist work of a type which is limited to very few beds in any hospital, a Senior Honorary should not hold office in more than one hospital.
(3) The number of beds held by Senior and Junior Honoraries should be in the proportion of 3 to 1.
(4) The number of beds allotted to an Honorary should not exceed, in public hospitals (other than teaching hospitals) 18 beds.
(5) In order to give opportunities to as many of the profession as possible, the retiring age of Honoraries should be 57 years.
(6) In all medical appointments, including the specialties, members of hospital boards, whilst being permitted to fully avail themselves of the advice of the Medical Advisory Committee, should be held responsible for ensuring that an unreasonable number of appointments is not held by any one man.
(7) Honoraries be compelled to observe punctuality and efficiency in order to establish a standard and an example for the rest of a Hospital Staff.
(8) The services of Honoraries retiring under subparagraph 5 above be availed of as Consultants.

SECTION 6.

Medical Appointments.

(Teaching Hospitals.)

1. Whilst your Committee commends the honorary system and recommends it for Public Hospitals, it believes that an exception should be made in so far as teaching hospitals are concerned.

It does so because it believes the medical profession has such a great contribution to give to the welfare of the nation that only the best training possible for its students should suffice. Further, your Committee is of opinion that, whilst the Honorary Medical Officer earnestly desires to give of his best in the teaching of students under his care, he is unable, under present conditions, to achieve that aim.

The close study which ever-increasing developments in medicine impose upon him; the very considerable duplication of subjects, together with the competitive work required to win and hold a practice, leaves him with little hope of giving the student that more intensive training which your Committee considers desirable.

2. Irrespective of how devoted he may be to his students, and to his hospital duties, there must, of necessity, be many occasions when the obligations imposed upon him by his private practice preclude his attendance at his hospital and deny him the opportunity of giving the attention to his students that he would wish. Undoubtedly those obligations may have been urgent and unavoidable, and their observance has been frequently unremunerative. However, while recognising the difficulties, your Committee considers that the requirements of a private practice necessarily disadvantage both the student and the hospital patient. Therefore, it is necessary to devise a hospital teaching system which will permit the teacher and the student to spend more time together, not only in the wards, but also in the laboratories, the outpatients' clinics, and the post-mortem room. Such a system should allow abundant time for full and frank discussion between the teacher and his students. Your Committee believes this can best be done by having part-time paid medical officers in the main teaching hospitals, with hours of attendance definitely stipulated and rigidly adhered to.

3. Therefore, in regard to teaching hospitals, your Committee recommends that—

1. There be instituted a part-time paid system in teaching hospitals.
2. Doctors attend their hospitals on five half-days per week, each half-day to consist of four hours.
3. The salary of each such doctor shall not exceed £600 per annum.
4. The doctors' hours of attendance be definitely stipulated and rigidly adhered to.

SECTION 7.

Treatment of and Charges to Patients.

In-patients.

1. Your Committee is of the opinion that whilst the treatment of patients is ever open to improvement the patients in the public hospitals of this State generally are well cared for and the treatment and consideration given them compares favourably with that of public hospitals elsewhere.

Certain witnesses complained of unsatisfactory treatment, and there are undoubtedly times when more might be done for the welfare of patients. This, however, applies not only to public hospitals but even to the best of private hospitals.

Expense naturally enters into the problem and much more could certainly be done in public hospitals if more funds were available. The suggestion made elsewhere in your Committee's Report that more Honoraries should be engaged will, if adopted, give even more satisfactory results—especially by the greater "spread" of honorary work.

2. Your Committee is of the opinion that, in general, Honoraries of public hospitals should visit their patients not less than three days per week, and, where an Honorary is absent from his patients for more than three consecutive days, the care of those patients should automatically revert to the control of the Medical Superintendent.

3. Your Committee finds it difficult to explain the large exodus of patients from some of our public hospitals just before Christmas. Figures supplied to your Committee show that in some cases the proportion leaving hospital in the week immediately prior to Christmas is considerably greater than in any other week of the year. The only conclusion to be drawn from this fact is that either in the week prior to Christmas many patients leave hospital before they are well enough to do so or at other periods of the year there are many patients in hospital well enough to be discharged.

4. Regarding the charges made to patients, your Committee has observed that the highest charge made to public patients who pay the full fee is invariably well below the cost of their maintenance and that poorer patients are asked to pay only according to their financial ability and, if their circumstances warrant it, are given their hospital treatment and accommodation without charge. In these circumstances your Committee is of opinion that present hospital charges must be considered fair and reasonable.

5. Unfortunately, evidence which has been adduced before your Committee suggests that many patients try to evade their obligations to hospitals and do not pay all they can afford, and that even in a questionnaire much wrong information is given. Evidence was also given that "hospital officers often have the experience of a patient whose income is £4 per week being very willing to pay more for his maintenance than a patient whose income is £6 per week." It is therefore to be regretted that some patients are apparently unwilling to meet their obligations to our public hospitals.

6. It might be mentioned that your Committee was impressed with the method of partitioning the public wards of the Brisbane General Hospital. These partitions which are about seven feet high divide the wards into three sections and give a certain degree of privacy much appreciated by the patients.

7. Your Committee believes the establishment of intermediate wards should be encouraged, but that the charge for beds therein should not be below full maintenance cost.

Section 8.

Outpatients.

1. Evidence has shown that a very large number of patients attends the outpatients' departments of our public hospitals. This number is increasing daily, and, in some hospitals, owing to the inadequate and unsatisfactory housing conditions, considerable overcrowding and inconvenience is being occasioned both to the patient and to the hospital staff. These housing conditions should be improved at the earliest possible opportunity.

Unfortunately, the waiting periods for patients appear at times to be extremely and unnecessarily long, sometimes extending to three hours and more—two hours being quite common. This your Committee regards as wrong and unnecessary, particularly when patients are really ill or are women with young children. Furthermore, when patients suffering from infectious diseases are waiting long hours in the company of others, their infection is being spread. Your Committee believes that much of this trouble is caused by honoraries in some hospitals having far too many outpatients to attend, and this difficulty could largely be met by the appointment of additional honoraries to those hospitals. Again, some of the trouble appears to be caused by lack of punctuality on the part of the honoraries, or probably by patients being asked to attend hospital long before the honorary is due.

2. Your Committee believes that a system can and should be devised by all public hospitals whereby patients could be examined and attended to within a reasonable time. A solution of the problem should present no great difficulty. Probably different hours for old and for new patients would remove a considerable amount of the trouble, or perhaps the adoption of an appointment system would be helpful; but there will be no solution until there are sufficient honoraries appropriate to the number of patients requiring attention, and those honoraries are prepared to be punctual and regular in their attendance.

3. Your Committee, however, expresses its concern at the large number of patients attending the outpatients' departments who are really in a position to pay lodge fees. These people should attend their own doctors. For a small weekly fee these patients could join a lodge and obtain from a doctor of their own choice the best of attention for themselves and families, but apparently they prefer to wait long periods in draughty hospital waiting rooms and corridors rather than pay that small fee. Such an attitude is difficult to understand, as it is not only unfair to themselves and their families, but is also unfair to the medical practitioner and particularly to the sick poor who, unable to afford lodge fees, are greatly inconvenienced and even crowded out by those who can, but will not, pay. The position is the more extraordinary when it is recalled that in the basic wage, allowance is made for lodge fees. An examination of the basis upon which that wage is founded reveals that the "miscellaneous items" includes in an amount of 16s. 3d. the sum of 6s. 6d., to be applied as under:—

	s.	d.
Lodge dues and medicine	2	0
Recreation	2	0
Smoking	2	0
Union dues	0	6

Yet, in how few cases is the sum of 2s. for lodge dues applied in the direction for which it is intended? If objection to joining a lodge is at the base of this neglect, then the Government might favourably consider the adoption by the Government Insurance Office, or some such body, of a scheme which would give medical benefits similar to those obtainable through lodge membership.

Such a scheme, if authorised by the Government and supported by the British Medical Association, should be successful. Many sick people, in the early stages of disease, will not attend a public hospital until the sickness begins to develop seriously. It is frequently found that this non-attendance is occasioned by the distances such people have to travel to reach a hospital. If those same people were lodge patients, with a doctor near at hand and able to visit them immediately they became ill, many cases of serious illness would be prevented.

Your Committee therefore recommends that:—

1. A sufficient number of honoraries should be appointed to the outpatients' departments of all public hospitals.

2. Steps should be taken to ensure that outpatients at public hospitals are attended to within a reasonable time; and as a means towards that end—

(a) there should be appointed to all public hospitals sufficient medical staff to deal efficiently and expeditiously with the outpatients;
(b) honorary doctors attending outpatients' departments shall be regular and punctual in attendance;
(c) the methods suggested in paragraph 2 of this section or any other appropriate means deemed necessary, be adopted.

3. As there is an allowance in the basic wage of 2s. for lodge dues and medicine, the Government, in the interest of the recipient, and as a means of preventing much serious illness, should give consideration to some appropriate method of encouraging the allocation of that portion of the basic wage for the purpose for which it was intended.

4. In order to relieve the congestion of outpatients' departments at public hospitals, the Government give consideration to the establishment of further outpatients' clinics in the various suburbs.

Section 9.

Post Graduate Work.

1. By reason of its isolated position, its distance from the University, its lack of obstetrical and children's wards, and the absence of a large outpatients' department, your Committee regards Prince Henry Hospital as being unsuitable as a post graduate hospital. Owing to these shortcomings and disadvantages much post graduate work has to be done elsewhere. Further, although Prince Henry Hospital is primarily an infectious diseases hospital, little, if any, instruction therein appears to have been either given or sought.

Further, your Committee is of the opinion that Prince Henry Hospital should remain primarily an infectious diseases hospital as its isolated position does not warrant its expansion into a large general hospital. In view of this, it is considered that post graduate work should be transferred to one of our large teaching hospitals, preferably Royal Prince Alfred, owing to the close proximity of that

hospital to the Sydney University where many of the post graduate lectures are given and much of its teaching work is done.

Your Committee sees no reason why both undergraduate and graduate work cannot be carried out at this hospital. Actually, the post-graduate work is carried out by the University through the New South Wales Post-Graduate Committee in Medicine—the Chancellor, Vice-Chancellor, and Dean of the Faculty of Medicine of the University being *ex-officio* members of the Committee.

2. Your Committee believes that such a transfer, as suggested above, would establish efficient post graduate teaching, and would also save considerable expense and duplication. In fairness to those Executive and other officials who have devoted considerable time and energy to the Post-Graduate School, your Committee is of the opinion that, provided they come within the Committee's suggested age limit, they should, if they so desire, be appointed to positions on the Post-Graduate Staff of the hospital to which the transfer is made, similar to those they now occupy.

SECTION 10.

Bed Vacancies.

1. Your Committee found that it was a general complaint amongst medical practitioners that invariably there is difficulty in obtaining admission of patients to public hospitals, particularly if the practitioner concerned did not happen to be an honorary of one of the larger of those hospitals. "Being an honorary at a big public hospital gives one a better opportunity of getting beds in that hospital", stated one witness.

2. Your Committee is satisfied that in many instances preference regarding beds is given to honoraries by their respective hospitals and that practitioners who do not happen to be honoraries are at times compelled to suffer considerable inconvenience in obtaining admission of a patient to hospital. But whilst this trouble certainly exists, the principal difficulty must be regarded as a shortage of beds in public wards, and for this reason some practitioners waste hours per week telephoning various hospitals endeavouring to obtain the admission of patients, many of whom are urgent cases.

3. Typical quotations from the evidence of many different medical practitioners are: "At some hospitals I have great difficulty in getting a patient a bed."

"At certain hospitals I find it impossible to get in a public patient, it is the bugbear of my profession."

"I have experienced much difficulty in getting patients into public hospitals."

These statements were supported generally, and instances were given to show that several days had elapsed before urgent cases could be admitted to hospital and that lives might have been saved if the patients had been admitted when application for admission was first made, instead of some days later.

4. Your Committee is of the opinion that the only consideration governing preference in admission of patients should be the urgency of the case.

The holding of hospital beds vacant for prospective patients of Honoraries whilst deserving cases are denied admission should be regarded as a most reprehensible practice.

Another matter that needs serious attention and consideration of the Government is the practice (referred to in evidence) of some doctors in being prepared, at times, for their own convenience, to send patients to hospital even though they know the patient is not sufficiently ill to warrant treatment in hospital. Such a practice, if it exists, is wrong.

5. Your Committee is therefore of opinion that a central hospital admission depot should be established in Sydney to which all public hospitals would report at stated times the number of vacant beds in their hospitals, and to which the medical profession and the public generally could make application for admission of patients. Such a depot should do much to overcome the present difficulties, and would also prevent patients being sometimes sent to hospitals many miles away from their districts when there were vacant beds in hospitals nearer at hand.

6. Your Committee accordingly recommends that:

> The Government establish a Central Hospital Admission Depot, to which all hospitals would report bed vacancies at stated times.

SECTION 11.

Hospital Supervision and Control.

1. Your Committee is of opinion that one of the most important phases of hospital work in respect to efficiency and economy is that relating to supervision. Nevertheless, your Committee has observed that with the exception of a few of our very large hospitals, Hospital Superintendents appear to be young men with little practical experience either in medicine or in hospital administration. Unfortunately, a difference of opinion seems to have always existed between laymen and medical men as to who actually should be a hospital's chief executive officer. Prestige seems to have entered into the question on both sides: whereas the real problem to be considered is how to devise a method which will give to a hospital the best and most efficient service possible at the lowest cost.

2. Hospital organisation consists of two sections—the medical (including medical superintendence) and the managerial (business) and each must play its fundamental part as portion of and be co-ordinated with the greater problem of medical service to the community. Therefore, if complete superintendence is to be under the single control of a medical man, that man should not only have had a sound practical medical training but should also be possessed of a good business and executive knowledge. Where then is a medical man to obtain such a training? The medical course in this State may teach a student to diagnose disease, but it teaches nothing of hospital management either from the point of view of medical administration or from the purely business or managerial aspect of hospital administration. As there is no such training medium here for medical graduates desirous of taking up hospital superintendence as a profession, most of such graduates seem to drift into the position of a Hospital Superintendent merely temporarily or as a step towards preferment in some other avenue of their profession.

3. Your Committee is of the opinion that the administrative side of medicine should be regarded as one of its specialties as a Superintendent is becoming every day a more important factor in the smooth running and efficient and economic management of a hospital. As a competent man can be responsible even on the medical side for a great deal of economy, it is imperative as already indicated that a medical superintendent should be a man of experience and administrative ability and of mature age. He should, particularly if he is to exercise control over a large Resident and Honorary Medical Staff, be given reasonable tenure of office and complete medical control. Provision should therefore be made, in some way, for training graduates with a view to some of them specialising in hospital administration. Perhaps a way may be devised whereby those whom your Committee suggests should fill the position of student supervisor may be enabled to give portion of their time to this training and those who desire to take up the administrative side of hospital work be given preference for such positions.

4. Reverting to the question of lay versus medical control, your Committee is of the opinion that if a medical officer possesses practical knowledge in medicine, and, in addition, a sound knowledge of hospital administration and business management, he should undoubtedly have first claim to be appointed to the combined position of medical superintendent and chief executive officer, but how many are there who possess those qualifications? Another aspect that must be considered is that a medical superintendent in a large public hospital has splendid opportunities to make a tremendous contribution to medical progress in hospital work—especially in such matters as the care and welfare of patients and the supervision of Resident and Honorary Medical Officers (over whom he should have absolute and complete control)—that it is sheer waste of time for that officer to be concerned with the many questions, both important and unimportant, which occur on the managerial or business side of the hospital, particularly if he or she has had no business or executive training. Closer contact with each and every patient should be of greater importance.

5. Your Committee, in its Progress Report, drew attention to the growing "hospital mindedness" of the public; the large and ever-increasing amounts of money which a progressive hospital policy must require and the rising bed costs in public hospitals (in some cases reaching as high as £6 per week). These facts suggest that there should be in charge of the managerial side of every hospital an officer with considerable business training, who should be given both responsibility and authority in order to enable and encourage him to effect both economy and efficiency.

6. Your Committee was impressed with the following statement in the evidence of Sir R. W. Cilento, K.B., M.D., D.T.M. and H.F.R., San.I., Director-General of Health for Queensland:

> "Most hospital enquiries, and so far as I know, all hospital systems in Australia, have failed because they have over-emphasised either the 'medical' angle or the 'managerial' angle of hospital control as the principal matter to be determined, without realising that both

questions are fundamental aspects of the larger problem of medical service to the community, and that squabbles as to the authority simply serve to stultify progress and limit the excellence of the service the public has the right to expect."

7. The Brisbane General Hospital has what is commonly referred to as "divided control", Dr. A. D. D. Pye, M.B., Ch.M., F.R.C.S., F.R.A.C.S., having control of the medical administration, and Mr. H. Bolton, the Hospital Manager, control of the lay administration. Dr. Pye stated, "Our system has worked well, and relations between Mr. Bolton and myself have always been harmonious. I feel that I have a full-time job, and that he has one also." Mr. Bolton stated that, "There were no rules or by-laws of the hospital which defined the duties of both officers; only the understanding that 'The General Superintendent looks after the medical side and I attend to the business side'." These two officers appeared to work in complete harmony, and the Brisbane General Hospital compared very favourably, both in service to the sick and in its administrative costs, with the large public hospitals in this State.

8. Your Committee believes therefore that, whilst there may be certain difficulties in regard to divided control, it nevertheless seems that where the medical and the lay administrators are regarded as equal and given complete control of their respective departments and are prepared to co-operate as partners in a very humane and important undertaking, such control can be both efficient and economic.

9. Owing to the great variation in the size of public hospitals in this State it is difficult for your Committee to make a recommendation as to what system of hospital control should be adopted, as no one system would suit all hospitals. Nevertheless, it would seem that, judged by its success in Brisbane, the above-mentioned system has much to recommend it.

10. A matter of equal importance to the careful consideration which should always be given to the selection of the medical superintendent is that of the selection of a Secretary or Business Manager of a hospital. All hospital work is becoming more or less specialised, and your Committee believes that when appointments are being made to secretarial or managerial positions, consideration should always be given to the previous experience of the applicants in the administrative side of hospital work, particularly as it is entirely unlike any other type of lay work. As members of hospital boards are invariably business and professional men who have their own affairs to attend to and who work for their hospitals in an honorary capacity, they naturally have not unlimited time to give to hospital matters. It is therefore vitally necessary in the interests of economy and efficiency that those undertaking hospital administration, either on the medical or lay side, should be specially trained for their duties. On the lay side the aims of the Hospital Officers' Association are a step in the right direction. Your Committee believes that that Association, which has as its object the training of hospital secretaries and the general improvement of their standard, is worthy of commendation and encouragement.

Your Committee therefore recommends that consideration be given to the more efficient training of both Medical Superintendents and executive officers of Public Hospitals.

Section 12.

Hospital Requirements.

1. Apart from the shortage in the number of beds in general (acute) hospitals, your Committee is of the opinion that at present the principal needs in the hospital system of this State are the establishment of:—

(a) Infectious diseases hospitals;
(b) Additional accommodation for tuberculosis patients;
(c) Additional sub-acute (convalescent) hospitals;
(d) A lock hospital.

Prince Henry Hospital, which is also a general hospital, is (apart from some collecting depots attached to a few general hospitals) the only infectious diseases hospital in New South Wales. With reference to sub-acute hospitals, evidence was given that many sub-acute patients remain in our general hospitals for several months—even as long as two years. This type of patient should be transferred to sub-acute hospitals, which could be built and maintained at half the cost of the acute hospital. If such hospitals were built to accommodate these cases it would relieve—to a very considerable extent—the congestion in general hospitals, and, in addition, save much expense, both in building and maintenance. As to public hospitals generally, your Committee is of opinion that whilst our large general teaching hospitals merit every consideration that can be shown them (as referred to in paragraph 1 of Section 1), the importance of our district hospitals cannot be overlooked if we are to continue with our hospital auxiliaries and charitable workers of various kinds. These district hospitals, such as Royal South Sydney, Parramatta, Ryde, Manly, Marrickville, Western Suburbs, etc., are able to attract district interest by local citizens and charitable workers resident in the respective hospital areas. Similar local interest is not possible to anything like the same extent with our large central hospitals. These citizens and charitable workers do a great deal on the humanitarian side of hospital work and consequently relieve the Government of much expense. The district hospital also has the advantage of enabling patients to be treated largely in their own districts with a consequent saving of time and travelling expense to both the patients and their friends. Statistics submitted by the Hospitals Commission of N.S.W. show that this "local" type of hospital is relatively inexpensive to the Government particularly where the district interest is fully recognised and explored. An exception to this general reference is the Royal North Shore Hospital (which is much larger than the average district hospital), where costs have been relatively high.

Your Committee therefore recommends that:—

1. Sufficient infectious diseases hospitals be erected to meet the needs of the State.
2. Additional accommodation for T.B. patients be provided.
3. Sufficient sub-acute hospitals be erected to relieve general hospitals of "long-stay" sub-acute cases.
4. The Government give consideration to the erection of a Lock Hospital.
5. Where practicable, district hospitals be enlarged gradually as the local position demands to an economic unit—say, up to 200 beds—and the district spirit be fostered and encouraged amongst hospital workers.

Section 13.

Hospital Finance.

1. It is not your Committee's intention to make any recommendations in this report regarding hospital finance. This problem was fully dealt with in its Progress Report. However, some additional evidence has been taken since that Progress Report was submitted, and it is felt that the following observations on hospital finance may not be out of place here.

Your Committee's recommendation in its Progress Report respecting the financing of hospitals in this State, and which it regarded as the basis of its scheme, was that local responsibility should be encouraged.

The relevant portion of the recommendation was as follows—

Local Responsibility.

(a) That legislation be introduced creating Hospital Zones throughout the State (similar to Queensland Hospital Legislation).

(b) That each of these zones be controlled by a Hospital Board representative of the hospitals within the zoned area.

(c) That on each such Board there be representation of the local governing bodies within each zoned area.

(d) That where the Government has contributed its fair share of State aid to any hospital or hospitals within a zone, and such hospital or hospitals still remain in debt, then it shall have the right to call upon the Board of that particular zone to issue a precept to the value of the hospital deficit, and all local governing bodies within that zone shall contribute to the deficit proportionately according to the rateable value of the properties within their areas.

In support of the above recommendation and as a means of raising the Government's share of the funds required for Hospital finance, your Committee made the following *principal* recommendations:—

1. That there should be established a Zoned Voluntary Hospital Contribution Scheme.
2. That lotteries be extended so as to return more revenue with periodical mammoth lotteries.
3. That an amount of £150,000 be derived by taxation upon the manufacture, purchase and sale of alcoholic beverages—such tax to be exclusively applied to the maintenance of hospitals.
4. That third party insurance be established, providing for the compensating of hospitals for costs caused by all in-patients and out-patients resulting from road accidents and, in addition, an allocation to hospitals of £50,000 per annum from the Main Roads Fund.
5. That all incomes of the basic wage and over be taxed sufficiently to raise the sum of £1,000,000 per annum, such tax to be part of the social services tax, and to be definitely retained and allocated for hospital purposes.

2. Your Committee regards local responsibility as fundamental to the success of any Government-subsidised scheme,

particularly where hospitals are controlled by honorary local boards, as is the case in this State. It recognises that it is not without difficulty that a Government or the public can be convinced that a method that was suitable twenty-five years ago (when hospitals were inexpensive to maintain and little used by the public) is quite unsuitable to-day, when there are extremely heavy and ever-increasing demands upon the same institutions and their revenue has not increased proportionately. Nevertheless, your Committee goes so far as to say that the ever growing public demand on hospital accommodation and treatment, together with the greatly increased expense, renders the partly subsidised scheme, as adopted in this State, obsolete and unsatisfactory, especially as it does little to compel or encourage local economy and efficiency. In fact, it places a premium on inefficiency, as the hospital with the greatest deficit (irrespective of the fact that such deficit may be the result of poor administration or apathy on the part of local citizens) invariably succeeds in obtaining the largest subsidy.

3. In view of the fact that full provision is made for the total expenditure of every other Government Department—such as the Education Department with its huge teaching staff; the Colonial Secretary's Department with its large Police Force; the Justice Department with its maintenance of Court Houses, gaols, etc.—it is difficult to understand why hospitals—the expenditure upon which forms such a large part of the Health Department's total expenditure—should be left in the indefinite position of not knowing what Government subsidy they will obtain; what local support they will be given, and what credit or deficit can be ultimately expected. Your Committee can, however, understand extremely harassed and earnest members of a hospital board wondering just why the final responsibility for their hospital's solvency should be theirs—an honorary body—instead of that of the whole community served by their particular hospital. On the other hand, a Government cannot be expected to be continually handing out subsidies to a hospital whose board is not doing its duty. It is this indefiniteness, this lack of knowledge of exactly what revenue and what subsidy a hospital will eventually receive—no matter how hard and earnestly its board may apply itself to its task—which creates the most unsatisfactory phase of the present system.

4. The financial difficulties of our hospitals to-day are largely due to the following causes:—

(a) The increasing "hospital-mindedness" of the public and its greater confidence in public hospitals resulting in consequential greater demands on those institutions.
(b) The greatly increased cost of modern hospital treatment and maintenance, particularly in our large central hospitals, which provide for every type of illness.
(c) The increase of new methods of treatment necessitating the purchase and maintenance of new and expensive apparatus.
(d) The wider distribution of wealth to-day and heavier individual taxation which greatly reduces the ability of charitably disposed people to make to public hospitals those large donations which in the past were such a boon to them—the larger numbers of donors of small contributions being unable to make good the deficiency.

These factors cannot be ignored and your Committee is of the opinion that new methods must be introduced to meet the changing times.

5. Much has been said of the voluntary aspect of our hospital system; of the need for that humane spirit of charity and benevolence often referred to as the "soul of our hospitals." Too much could not be said in favour of the great body of charitable workers and humane citizens who work and give in the interests of the sick. Amongst them will be found our best citizens, and our hospitals would be the poorer wtihout them. Their benevolence should be encouraged and not used as an excuse for neglect by Governments, indifference by local citizens, or inefficiency by hospital boards.

6. Your Committee therefore desires to again suggest to your Honourable Houses the need for consideration to be given to the creation of a hospital policy which will provide for local responsibility as suggested in paragraph 1 of this Section.

Your Committee believes that the adoption of such a policy would give the hospital system of this State that degree of stability in its financial affairs which is becoming so increasingly necessary each year, and which it believes would be welcomed both by the public hospitals and the Hospitals Commission of New South Wales.

Evidence submitted to your Committee shows that the trend in hospital affairs both in Australia and overseas is towards local control and responsibility.

SECTION 14.

General Considerations and Recommendations.

1. *Closed System.*

Judging by the evidence given before your Committee, there seems to be considerable dissatisfaction amongst medical practitioners generally regarding the Closed System in operation at Gloucester House. Your Committee is therefore of opinion that, whilst such a system may be permissible as an adjunct to a teaching hospital, the system should not be adopted in other than teaching hospitals, as it would not be in the interests of either the medical profession or patients.

2. *Nursing.*

A matter requiring earnest consideration is the gap between the school leaving age and the minimum age for entering upon a nursing career, *i.e.*, eighteen years. This your Committee regards as too great.

Girls in commerce go there straight from school but those desiring nursing as a career have to wait two or three years before they may commence their profession. Your Committee was impressed by a system in operation in Balmain Hospital where strong, well-matured girls, of 16 years of age, are selected for duty in the children's ward only, during their first year. In the second year, at 17 years of age, they enter the female ward, and at 18 years, are ready to commence their duties in the general ward. This not only means that the prospective nurse avoids the two years' waiting before entering hospital, but, in addition, that she enters the general wards with a considerable amount of nursing experience. Your Committee recommends this system as being worthy of consideration by other hospitals.

3. Your Committee makes the following general recommendations:

(i) *Workers' Compensation Act.*—That the Workers' Compensation Act be amended in such a manner as would ensure the removal of certain anomalies and injustices to public hospitals and to patients.
(ii) *Collective Buying for Hospitals.*—That consideration should be given to implementing a scheme for the collective buying of all goods and necessities required by hospitals.
(iii) *Classification of Out Patients.*—That a duly qualified person be stationed in the Out Patients' Department of every public hospital to investigate and classify the more serious cases of illness prior to the patient's examination by a medical officer.
(iv) *Deaths of certain Patients in Public Hospitals.*—That in the event of the death of a patient in a general hospital, it should be the responsibility of the executive officers of that hospital to ensure that a notification of the death of the patient shall be transmitted to the doctor who may have attended the patient prior to his admission to hospital, and such notification shall record the date of death and cause thereof.
(v) *Importation of Medical Instruments Duty-free.*—That in order to permit advantage to be taken of scientific progress in other countries, important medical and life-saving instruments (particularly where such instruments are not made in Australia) should be admitted duty-free when ordered by a hospital.
(vi) *Reduction in Costs of Essential Services.*—That consideration be given to the granting to public hospitals of a reduction in the costs of essential services, as is now in operation in Brisbane.
(vii) *Printing of University Lectures.*—That lectures given at the University Medical School be printed and circulated to all medical students prior to the lectures being given.
(viii) *Need for Resumption of Missenden Road, Camperdown.*—That in the interests of the patients of Royal Prince Alfred Hospital, the Government give serious consideration to the need for resuming such portions of Missenden Road as may be necessary for hospital purposes.
(ix) *Ability of Country Hospitals to Teach Graduands.*—That the Government should ascertain and declare what Base and/or other hospitals in the country districts are able to take and teach graduands during the compulsory hospital year required to be served after graduation.
(x) *Radium and Radiology.*—That
  (1) The study of radium and radiology should be given more attention by the University authorities and by teaching hospitals;
  (2) The use of radium be controlled, and restricted to medical practitioners who are fully qualified by experience and training in its scientific application.

(xi) *Future Hospital Construction.*—That all future hospital construction be carried out in accordance with a co-ordinated plan to avoid haphazard development of the hospital system.

N. THOMAS,
Chairman.

No. 2 Committee Room,
3rd December, 1940.

Naval, Military and Air Force.

APPOINTMENTS.

The undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 69, of April 3, 1941.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Appointment.—Henry Bertram Holmes is appointed Surgeon Lieutenant, dated 15th March, 1941.

Australian Military Forces.

AUSTRALIAN ARMY MEDICAL CORPS.

Northern Command.

First Military District.

Captain N. Geaney is retired, 19th February, 1941.

Reserve of Officers.—The appointment of Honorary Captain C. V. W. Brown is terminated, 17th February, 1941.

Eastern Command.

Second Military District.

The date of appointment of Honorary Captain H. H. B. Bradley which appeared in Executive Minute No. 232/1940, promulgated in *Commonwealth Gazette*, No. 258 of 1940, is amended to read 26th July, 1940, and the notification respecting this officer which appeared in Executive Minute No. 38/1941, promulgated in *Commonwealth Gazette*, No. 31 of 1941, is cancelled.

Southern Command.

Third Military District.

The following officers are appointed from the Reserve of Officers (A.A.M.C.) on the dates shown and to be Captains (provisionally): Honorary Captains F. C. H. Ross, 4th February, 1941; A. R. Haywood, 15th February, 1941; S. E. Francis, D. R. Gauld and M. M. Pearl, 3rd March, 1941.

Sixth Military District.

Reserve of Officers.—The date of appointment of Honorary Captain G. M. Crabbe which appeared in Executive Minute No. 235/1940, promulgated in *Commonwealth Gazette*, No. 1 of 1941, is amended to read 19th October, 1940.

Western Command.

Fifth Military District.

W90 Honorary Captain L. E. S. Gelle is appointed from the Reserve of Officers (A.A.M.C.), 10th February, 1941, and to be Captain (provisionally).

Reserve of Officers.—To be Honorary Captains—Frederick Joseph Nathan, Bernard James O'Keefe, Squire George Silverstone, Walter Alexander Smith, William Frederick Stockwell, Reginald Grant Teasdale, William Franklin Wyatt, Ernest Sylvester Luscombe, 11th February, 1941; Edward Henry Edmondson, 17th February, 1941; Kenneth George Wyatt, 19th February, 1941; and Ernest Cecil Eagleton, 23rd January, 1941.

WIRELESS TRANSMISSION APPARATUS (POSSESSION) ORDER.

The following letter received from Surgeon-Captain Carr, Director of Naval Medical Services of the Royal Australian Navy, in regard to the provisions of the Wireless Transmission Apparatus (Possession) Order, recently issued, is published for the information of readers.

Sir: With reference to my memorandum 13490, of 14th March, and previous correspondence, on the subject of screening Diathermy Sets, and other high frequency electrical apparatus, the following extracts from a letter forwarded to Secretary, Department of the Navy, from the Postmaster General's Department, are sent to you for information.

> "It is practically certain that the Department will arrange for the provisions of the Wireless Transmitting Apparatus (Possession) Order relating to the screening of certain equipment to be continued in appropriate legislation at the termination of the war.
>
> Considerable interference to commercial and defence services has been caused by the types of apparatus covered by this order. It would therefore be a retrograde step to permit a return to the conditions which prevailed prior to its promulgation."

It is thought that the knowledge that this Order will, in all probability, be of a permanent, and not of a temporary, nature, will be of value in making decision on the type of screening adopted.

Yours, etc.,
W. G. Carr,
Surgeon Captain, R.A.N.,
Director of Naval Medical Services.

Navy Office,
Department of the Navy,
Melbourne.
April 8, 1941.

A CORRECTION.

Sir: In the journal of April 5, in quoting the *Commonwealth of Australia Gazette* Number 55 of March 20, 1941, certain R.A.A.F. appointments are indicated under the heading "Permanent Air Force".

This is incorrect, as all these appointments refer to the Citizen Air Force.

E. A. Daley,
Group Captain,
D/Director of Medical Services.

Air Board,
Air Force Headquarters,
Melbourne, C.1.
April 9, 1941.

Correspondence.

SOME MEDICAL ASPECTS OF CRIME.

Sir: If, as a hopelessly philistine but interested observer, I may do so without impertinence, I should like to "butt in" on the peculiarly interesting debate in your columns under the above caption; in which in the past few weeks diamond has cut diamond in a display of provocative thinking and verbal pyrotechnics such as leaves most of us gaping, as at an aerial "dog-fight". I am emboldened to do so since my contribution is at second-hand, and thus gives me a chance to "bail out" if I should mischance to come within the field of fire.

In his erudite and provocative work "Decisive Battles" Major-General Fuller—it is obviously the keynote to his purpose in the book—has some illuminating, and at times very disconcerting comments to make on the social significance of the events and the characters which form the subject of his studies.[1] Many, most indeed, of these comments deal with problems that belong to the very foundations of civilization. As such they come within the ambit of current discussions on the "New Order", to which, in its essence, this debate belongs, and which, with some real honesty of purpose and intention but with more of self-delusion and even of blatant hypocrisy, we are one and all pledging ourselves to conjure from the democratic bag if, and when, for the second time, it shall have been "saved" by victory.

Commenting on the character of Caius Julius Cæsar, he writes as follows:

> Three closely related principles became his guiding trinity in unity—Authority, Order and Discipline. First, he changed the character of the central government by becoming its directing head, whilst he reduced the oligarchic powers of the Senate to those of a Council of State under his chairmanship. Rome he made the denationalized capital of the many nations. Secondly,

[1] "Decisive Battles", by Major-General J. F. C. Fuller, Volume I, pages 81-82.

he set about establishing a new political order which would give life to Rome and the Provinces, and weld them into one being. He set about limiting the Money Power which had been the ruin of the Republic; relieved the Provinces of money-making governors; sent out to them no less than 80,000 colonists, and so permitted democracy to expand more freely. Thirdly, he aimed at creating a new social discipline, which, I think, can best be explained by quoting from a speech he made at Placentia, in 49 B.C., to some mutinous soldiers. He said:

"For no society of men whatever can preserve its unity and continue to exist, if the criminal element is not punished, since, if the diseased member does not receive proper treatment, it causes all the rest, even as in our own physical bodies, to share in its affliction. And least of all in armies can discipline be relaxed, because when the wrong-doers have power they become more daring, and corrupt the excellent also by causing them to grow dejected, and to believe that they will obtain no benefit from right behaviour. For wherever the insolent element has the advantage, there inevitably the decent element has the worst of it; and wherever wrong-doing is unpunished, there self-restraint also goes unrewarded . . . For it is not by any characteristic of birth that what is friendly is distinguished from what is hostile, but it is determined by men's habits and actions, which, if they are good, can make that which is alien like unto itself, but if bad, can alienate everything, even that which is alien."

Though one cannot go all the way all the time with Major-General Fuller, this quotation from the great Roman soldier and statesman seems an authentic contribution to this problem of "crime". At the root of the problem, in the sense employed in this discussion, lies (as it seems to me) the stupendous question of human greed—"Mammon . . . the unchallenged god of the western world".[1]

Yours, etc.,

A. GRAHAM BUTLER.

Undated.

SIR: Dr. Dark's reply to my criticism calls for rejoinder. Dr. Dark, as I read him, set out to attack, I think very rightly, the use of corporal punishment, that is, pain or physical force in treating criminals. He then, quite inappositely as it seemed to me, quoted certain rules of the Soviet Government which, he considered, showed that in the U.S.S.R. punishment or reform by physical pain did not occur.

My criticism was: (i) That this was an unwarrantable assumption, as I held that there was evidence to show that in Russia there was physical punishment of a peculiarly horrible kind—much more ingenious and cruel than the crude forms used under British governments. (ii) That it was parallel to the claim made by so many observers that Russian methods were immeasurably superior to those of other countries, and I instanced the disregard of mass famines, forced labour camps and kulak raids, which the Stalinists justify on the old "omelette" excuse.

The position is exactly parallel to that of a medical writer who claimed that sulphapyridine cured all types of pneumonia. I consider that anyone would be justified in writing and drawing to his notice any evidence to the contrary and this is what I have done.

We next come to Dr. Dark's long paragraph dealing with advanced capitalist economy. I fail to see that it has any bearing. Penal methods under a capitalist system may be as humane as under a socialist—just as regiments could be disciplined without a single flogging one hundred years ago—and as probably some socialist prisoners can be so disciplined—what I claim is that others are not.

There follows Dr. Dark's discussion on the relative credibility of witnesses.

I didn't quote Trotsky, Souvarine nor Krevitsky, as a matter of fact, and Dr. Dark does not include Chicherin, whom I did mention.

Trotsky is suspect because he is an exile. Well, Voltaire was an exile, so was Victor Hugo, so is Professor Lips and so is Signor Nitti, but their attacks on the governments which exiled them do carry a certain weight. Krevitsky may or may not be a fraud, but it has been frequently pointed out that much of his revelations have "clicked" into the Russian jig-saw puzzle. Souvarine may have been expelled from the Communist Party, but so was Raushnigg from the Nazi, and his book has seen a wide recognition.

[1] "Decisive Battles", by Major-General J. F. C. Fuller, Volume I, page 481.

But I took my evidence mainly from Lyons (who put me on to Chicherin), Duranty, Moggridge and Littlepage. These may, I think, be considered as carrying a great deal more weight than the Dean of Canterbury, in that they spent much time in Russia, spoke Russian, and were brought into the closest relation with Russians of all classes; conceivably they might have seen and heard things which even the Webbs, Pat Sloan and Sigerist missed.

The whole question of outside witnesses, their observations and their deductions is an exceptionally difficult one, and I cannot do better than refer Dr. Dark to Moggridge's preface to "Winter in Moscow".

Let us take an instance nearer home. Probably Dr. Dark has read that delightful book "Cobbers". The author is a man of exceptional charm, remarkable ability and quick self-adjustment, moving among a people of his own blood, speaking their language and to a greater extent able to appreciate their mental attitude than any outside writer on Russia, except perhaps Maurice Hindus. I am quite certain that Dr. Dark would not consider "Cobbers" a fair picture of much of Australia.

I regret writing this letter; but it is not Dr. Dark's five lines of comparison which prompted me to write it, but the introduction of an argument not germane to the subject and the tendency to ignore evidence which could be called on the other side—in fact the sulphapyridine again!

It would seem that Dr. Dark, like the followers of Stalin and Hitler, has gone back to the mediæval conception of infallibility, and that any questioning of this infallibility is heresy to be stamped out. A good rule for the world would be that all claimants to infallibility should of necessity be considered wrong.

It seems to me that we do poor service to the very real achievements of the Russian Government by refusing recognition of the inconsistencies and cruelties which have accompanied them, in many cases quite unnecessarily.

Another dictator once bade the artist depict him wart and all—Stalin is more sensitive.

Yours, etc.,

S. F. MCDONALD.

"Craigston",
217, Wickham Terrace,
Brisbane, B.17.
April 2, 1941.

A CORRECTION.

SIR: Would you kindly publish the following corrections to my article on tsutsugamushi fever in North Queensland, which appeared in your journal on March 29, 1941?

On page 388, in the first column and the eighth line, the word "reached" should be "realized".

In the twenty-fourth line of the same column, the word "July", in brackets, should have been placed after the words "swamp rats".

Yours, etc.,

W. G. HEASLIP.

Adelaide,
April 3, 1941.

VENEREAL DISEASE.

SIR: Dr. P. Fiaschi has shown me a statement of Sir James Barrett in your last issue, that the defeat of the Fifth British Army in 1918 was largely due to the absence of men through venereal disease. The danger of such *obiter dicta* is that unless at once contradicted they may come to be scientific catchwords of the kind that so often circulate for generations.

The Fifth Army's defeat was actually due to the Germans throwing 43 divisions backed by 4,237 guns against 14 divisions supported by 1,566 guns. One has no wish to minimize in the slightest the ravages of venereal disease in the Army or in civil life; but taking Sir James's figures as correct—assuming, that is, that 400,000 British or Dominion troops were put out of action for five or six weeks during the Great War—the Fifth Army's share of this would be about 2,000 at any one time. Of these not more than half would be front line troops, making 1,000 the maximum of those away through venereal disease—an average of seven in a battalion, or of rather more than one per company (allowing for headquarters, transport and "nucleus").

May I add that my own belief is that the very serious figures for venereal disease in the Australian Imperial Force at certain times and places during the last war were largely due to the fact that in the hurried improvisation of the force it was not possible for the staff to give much attention to provision for decent recreation and something approaching

the amenities of home and civil life. In this respect we started miles behind the British; and I very much doubt whether in some of our camps—for example, Darwin—we have yet been able to approach the standard really necessary for the maintenance of morale, which is fundamental in this matter.

Yours, etc.,

C. E. W. BEAN.

Clifton,
Eton Road,
Lindfield,
New South Wales.
April 4, 1941.

Australian Medical Board Proceedings.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Thoren, Albert Robert, M.B., B.S., 1917 (Univ. Melbourne), 73, Federal Street, Hobart.
Stevens, Frank Richard Tod, M.B., B.S., 1937 (Univ. Melbourne), Devon Hospital, Latrobe.

QUEENSLAND.

THE undermentioned have been registered, pursuant to the provisions of *The Medical Act*, 1939, of Queensland, as duly qualified medical practitioners:

Miskle, Clarence Patrick, M.B., Ch.M., 1924 (Univ. Sydney), "Beerwah" Private Hotel, Gregory Terrace, Brisbane.
Gohstand, Samuel, M.B., B.S., 1940 (Univ. Sydney), General Hospital, Brisbane.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Foulsham, Wallace George, M.B., 1936 (Univ. Sydney), 101, Willoughby Road, Crow's Nest.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Arnott, David Bruce, M.B., B.S., 1940 (Univ. Sydney), 32, Campbell Parade, Bondi.
Bourke, Herbert Merwin, M.B., B.S., 1922 (Univ. Adelaide), 604, Railway Parade, Hurstville.
Goldsmith, Leslie Elmo, M.B., B.S., 1940 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Leventhal, William Alexander, M.B., B.S., 1940 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Murray, Alexander Francis, M.B., B.S., 1940 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Newton-Tabrett, Alice Eileen, M.B., B.S., 1930 (Univ. Sydney), 2, Pacific Highway, Roseville.
Thomas, Marjory Jean, M.B., Ch.M., 1918 (Univ. Sydney), 15, The Esplanade, Manly.
Woolnough, Arthur Ronald, M.B., B.S., 1940 (Univ. Sydney), Sydney Hospital, Sydney.

The undermentioned have been elected members of the Tasmanian Branch of the British Medical Association:

Gollan, Lachlan Neil, M.B., B.S., 1936 (Univ. Melbourne), 11, Norfolk Crescent, Sandy Bay.
Lewis, Reginald A., M.B., B.S., 1936 (Univ. Melbourne), General Hospital, Launceston.

Books Received.

"Manual of Physical Diagnosis, with Special Consideration of the Heart and Lungs", by M. Lewison, M.D., and E. B. Freilich, M.D., in collaboration with G. C. Coe, M.D.; 1941. Chicago: The Year Book Publishers. Large crown 8vo, pp. 317, with illustrations. Price: $3.00 net.

Diary for the Month.

APR. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
APR. 23.—Victorian Branch, B.M.A.: Council.
APR. 24.—Queensland Branch, B.M.A.: Brisbane Hospital Clinical Society.
APR. 24.—New South Wales Branch, B.M.A.: Branch.
APR. 24.—South Australian Branch, B.M.A.: Branch.
APR. 25.—Tasmanian Branch, B.M.A.: Council.
MAY 1.—South Australian Branch, B.M.A.: Council.
MAY 2.—Queensland Branch, B.M.A.: Branch.
MAY 6.—Queensland Branch, B.M.A.: Post-Graduate Committee.
MAY 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 7.—Western Australian Branch, B.M.A.: Council.
MAY 7.—Victorian Branch, B.M.A.: Branch.
MAY 9.—Queensland Branch, B.M.A.: Council.
MAY 9.—Victorian Branch, B.M.A.: Legislation Subcommittee.
MAY 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 13.—Tasmanian Branch, B.M.A.: Branch.
MAY 15.—Queensland Branch, B.M.A.: Ipswich Hospital Clinical Society.
MAY 15.—Queensland Branch, B.M.A.: Hospital for Sick Children Clinical Society.
MAY 15.—Victorian Branch, B.M.A.: Ethics Subcommittee.
MAY 19.—Victorian Branch, B.M.A.: Hospital Subcommittee.
MAY 20.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Proserpine District Hospital; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

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